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# CANADIAN GEOGRAPHICAL JOURNAL

## In This Issue

A MESSAGE FROM THE EARL OF BESSBOROUGH  
MEN OF THE LONG PORTAGE      YUKON AND HER FLOWERS  
FRENCH-CANADIAN HANDICRAFTS

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As one of its major activities in carrying out its purpose the Society publishes this monthly magazine, Canadian Geographical Journal, which is devoted to every phase of geography—historical, physical, and economic—first of Canada, then of the British Empire and of other parts of the world in which Canada has special interest. It is the intention to publish articles that will be popular in character, easily read, well illustrated and educational to the young as well as informative to the adult.

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General



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*This magazine is dedicated to the interpretation, in authentic and popular form, with extensive illustration, of geography in its widest sense, first of Canada, then of the rest of the British Commonwealth, and other parts of the world in which Canada has special interest.*

*The British standard of spelling is adopted substantially as used by the Dominion Government and taught in most Canadian schools, the precise authority being the Oxford Dictionary as edited in 1929.*

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## An Appeal from the Governor General

GOVERNMENT HOUSE,  
OTTAWA.

*As Honorary Patron of the Canadian Geographical Society I have been particularly pleased to learn that, in spite of the difficulties of the last few months, the Society has been able to reestablish the Journal -*

*The C. G. S. through its Journal is doing valuable work for Canada, & I appeal to you as fellow members to give it your support.*

*Dec. 1832.*

*Bessborough*

**L**ORD Bessborough, himself a member of the Society, as well as its Patron, has taken a deep interest in the work it has been trying to accomplish for Canada during the last three years. His Excellency was so much concerned over the difficult position in which the failure of the Society's former publishers had put it that he has made a personal plea to his fellow-members to stand loyally behind this national organization and help to put it firmly upon its feet.

It should be distinctly understood that, although the Society, through no fault of its own, has been compelled to assume a considerable financial burden, it is not intended either to assess the members or to increase the annual fee. The Executive

Committee of the Society has so much faith in the real value of the JOURNAL that it asks you merely, in the language of the Governor General, to give it your support; and you can do that most effectively at the present time by building up the Society's membership. If each of us will regard it as both a duty and a privilege to enlist as many new members as possible among our friends and acquaintance, the JOURNAL will become an assured success, and the Society will not only be in a position to clear itself of all financial obligations, but may look forward to the opening up of a much wider field of usefulness than has been possible in the past. Please send the names of those who wish to become members to the Canadian Geographical Society, Sun Life Building, Montreal.





His Excellency the Right Honourable the Earl of Bessborough, P.C., G.C.M.G.

Governor General and Commander-in-Chief of the Dominion of Canada.

*From the portrait by Richard Jack, R.A.*

## THE BIRTH OF A METROPOLIS



*Above is Fort Garry as it was in the middle of the 19th. Century, a vantage point of pioneer enterprise in Western Canada; headquarters of L'Esperance's York Boat Brigade, freighting supplies to the west by way of the Long Portage and cargoes of furs back to the east.*

*Below is a photograph, by the Royal Canadian Air Force, of part of the business section of the city of Winnipeg, which has arisen on the site of old Fort Garry.*



# MEN OF THE LONG PORTAGE

By JOHN PETER TURNER

**S**INCE the earliest pathfinders of New France first penetrated the wilderness beyond Lake Superior, the junction of the Red and Assiniboine Rivers has furnished a common vantage-point for western enterprise. From here, the *Sieur de la Verendrye* and his gallant sons, emerging from the eastern forests in 1738, gazed in wonder upon the meadows of the west. Here a natural highway lured the earliest adventurers toward the setting sun. Here, more than a hundred years ago, at the very heart of the northern continent, the Company of Adventurers of England Trading into Hudson's Bay came to grips in bitter competition and eventual amalgamation with the dashing North West Company of Montreal. Hither, the altruistic and sagacious Thomas Douglas, Earl of Selkirk, transported his first prairie colonists in 1811; and here, in due course, a keen competitive order of

During a residence of 30 years in the West Mr. Turner came in contact with many of the old-timers from Red River to the Rockies. He



JOHN PETER TURNER

has just completed an important contribution to the history of the Canadian West between 1869 and 1885 which will be published shortly.

existence evolved the first corporate community beyond the Great Lakes.

"Red River" and "Fort Garry" are familiar designations to that venerated remnant—the retired officers and servants of the early fur trade.

Among the dwindling pioneers, who saw the magic transition from buffalo to wheat, the names are bywords; and to all who by inseparable ties are linked in some measure with the early west, an intimate charm attaches to the annals of the old, Red River frontier. But to-day the world at large reckons little of the big trading establishment and the sprawling settlement that dominated the eastern margin of the Great Prairie in the middle of the last century. Around Fort Garry the various customs and pursuits—social, religious and industrial—gradually established the outstanding nucleus of activity in the whole north-west—the embryo city of Winnipeg.



*On the Long Portage*

Photograph from late Chief Factor R. MacFarlane, of the Hudson's Bay Company.

To look back. The spring of 1850 had risen from the lap of winter with all the energy of pent-up nature. The season of release had come. High within its banks, the Red River of the North, joined at the "Forks" by the swollen Assiniboine, had swept the grinding ice far out upon Lake Winnipeg. Moist winds blew softly from the soaking prairies. Meadowlarks called cheerily from nearby pastures; and wild geese winged northward toward their summer haunts.

With the pleasant change, the Hudson's Bay headquarters on the border of the plains stirred with renewed life. Keen-visaged plainmen, jaunty voyageurs, ruddy settlers from the river farms, came and went in care-free animation. Good-fellowship was in the air. Even the few Cree Indians idling along the sunny exterior of the palisades had discarded something of their taciturn aloofness. The long winter, so conducive to home life and merry-making, was at an end; and, among the many awakening activities of spring, the opening of the rivers was to all an event of primary importance that marked a period in the elemental traffic of the frontier.

For weeks, Fort Garry had been given over to final sorting and assembling of goods preparatory to an early departure of the boat brigades. As requisitioned at the annual council, held the previous June, the Chief Factor had long since acquired an adequate surplus of supplies for shipment. Storerooms had been well filled from the buffalo expeditions of the preceding summer; produce from the little settlement had been garnered in good quantity; commodities native and domestic, such as the district habitually furnished, had been accumulated, together with considerable furs awaiting transport to the coast. In and about the company's spacious compound unusual vigour prevailed. Minutes of the Northern Council had borne mandatory orders "That provisions and other country produce be provided at the Red River Colony for exportation to Norway House, summer 1850, made up in sound transportable packages." According to the official minutes of the company these were to include in stipulated quantities—"Bales of dried (buffalo)

meat; bags of (buffalo) pemmican; cured beef and hams; salt pork; rough barley; French beans; onions; dried flour; butter in firkins; cheese; Indian corn; eggs in kegs; biscuits; garden seeds; salted suet; tracking shoes; portage straps; leather tents; and oak staves and headings of dimensions." Council had further specified the necessary re-distribution from Norway House to distant trading-points, in keeping with practiced insight and careful calculation. Throughout the treasured fastnesses of the north exclusive trade in furs still flourished undisturbed; and the annual packing and baling of the varied products of "Red River," to meet in part the meagre exigencies of a widely-scattered people, went forward with all the care and precision of established custom.

From below the gray walls and bastions came sounds of busy preparation and light-hearted merriment. A dozen long York-boats, of high prow and stern and generous bulk, occupied the immediate river-front. Artisans were replacing broken parts; oars were being repaired and new ones shaped; splintered gunwales mended; seams caulked and pitched, and patches fitted. And hither had drifted a motley assemblage of rugged Orkneymen and Highland Scots, gay French-Canadians and native Metis (halfbreeds), Muskaygo Crees, and others, seeking mutual pleasantries or possible employment; while superintending the overhauling of the cumbrous craft were two whose names had long borne wide repute throughout the water-routes of Rupert's Land—the destined territory of western Canada.

Alexis L'Esperance—agile, dexterous, huge of stature—moved among the up-turned boats, helping where brawn and experience might count, or directing and instructing in the mellow patois of his kind. Here was the one man more than any other upon whom devolved the first essentials of the inland transport; who years before had been among the chosen in the great canoe of the doughty governor, Sir George Simpson; and who, by sheer ability and application, had succeeded, in 1834, to the premier command on the rivers of the north. Of striking presence, by nature and heredity born to the voyageur's life, of good Quebec lineage, and fortified by years of



faithful service, none could gainsay his rightful prominence among all the 1,200 and more Canadian voyageurs of his day. The other, Baptiste Bruce, whose rugged frame and dauntless spirit well-fitted him for leadership among the wild minions of the company's brigades, boasted Highland, French and Indian blood. Apprenticed from his native Churchill River, to rove in various capacities the unmapped waters of the wilderness, to become the company's pilot on the treacherous Liard River of the extreme north-west, to share in the first Arctic exploration to Point Barrow in 1843, he had finally reached well-merited reward — the appointment under *L'Esperance* to joint care and guidance of the great *La Loche* brigade.

In all the Company of Adventurers few men had bowed to greater tasks than had these two resourceful servitors — months of ceaseless toil, constant perils and privations, exacting and dangerous possibilities. Far from the confines of the world of men, over hundreds of

leagues of lake and river, lay their precarious and devious course.

The twelve staunch boats were soon put right and launched. Equal divisions were assigned the dual command to avoid confusion on the portages; and, at length, under the calculating and discerning eyes of long experience, the enrollment of the crews had been completed. Fore and aft and amidships the cargoes were stowed—approximately four tons to every boat. Mail packets were distributed lest boats be wrecked; and early on a June morning, while yet the Great Dipper glittered in the northern heavens, the men gathered,

eager to be gone. Final details were completed. A deluge of handshakes and bonhomies, a hubbub of wild imprecations and barking of dogs, a hurried invocation and sign of the cross for a safe return, and the crews sprang lightly to their places. The leading division drifted slowly from the shore. In each boat, four pairs of rowers or middlemen awaited expectantly, oars at the ready; bowsmen and captain-steersmen completed the crews; and, erect

over all in the stern of foremost, towered the stalwart *L'Esperance*. "Avant mes enfants!" the oars

dipped together; the boats lunged forward; . . . "Bon voyage Baptiste!" . . . "Bon voyage!"

"Adieu!" . . . "Adieu!"

Gradually, the shouting died away. The dip of ponderous oars grew indistinct; and with their measured sweep came drifting back the rollicking refrain of the old boat song:—

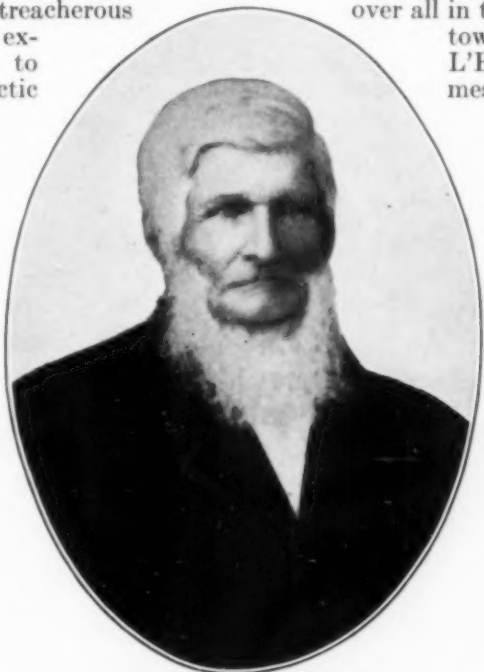
"En roulant ma boule roulant, en roulant ma boule.

Derrier' chez nous, ya-t-unétang. En roulant ma boule.

Trois beaux canards s'en vont baignant, rouli, roulant, ma boule roulant, En roulant ma boule."

Enthusiasm and excitement had speeded the annual transport upon its way; but not without some lonesome hearts that would share, in fancy, as the months passed by, the fortunes of departed kith and kin.

With Bruce in his wake by several days, *L'Esperance* held down the wide reaches of the Red, past the humble homesteads on either side. Then breakfast on a sloping bank—a hasty boiling of kettles, a frugal though sustaining meal of pemmican stew, a draw at the



ALEXIS L'ESPERANCE

*Agile, dexterous, huge of stature, who succeeded in 1834 to premier command on the Rivers of the North.*



ubiquitous pipe—and away, with grind and splash of oars; down the short rapids of St. Andrew's; past the Lower Fort Garry or Stone Fort and the Indian reserve of St. Peter's; and on, past the broad marshes at the river's mouth.

The huge expanse of Lake Winnipeg now lay northward for 300 miles; and masts being erected, the primitive square sails bellied in the breeze. Or, head winds prevailing, the boats worked slowly with the oars, plunging across long traverses from point to point along the eastern shores. Midday brought the accompaniment of steaming kettles in some sheltered cove; and again, with straining backs, the brigade pounded through the white-topped waves, mile on mile, till dusk crept out upon the lonely waters.

Scant was the fare for welcome halt on spruce-fringed shore or rocky isle—flour while it lasted, pemmican supplied by the company, tea and tobacco provided by the men, occasionally a few fish, caught hastily or procured from Indians along the way. Adverse or hopeful, each day was hailed with dogged acceptance and abandon. Storms swept down to find the wave-worn crews facing as uncomplainingly the rain-drenched camp, 'neath the sparse shelter of their waterproof prelarts, as when, at tranquil dusk rolled in their single blankets, they

turned to peaceful rest below the stars.

The picture of the improvised bivouac at close of day is primitive in its utter desolation—the flickering fires against the darkening forest; the indistinct sweep of sullen waters; the languished sigh of dying wind and wave; the impending hush, seeming to intensify each voice and sound; and, as the fires burn low, the primal stillness, broken only by some night bird or creature of the wilds. The cool night air brings childlike sleep. Undisturbed, the hours move round, till, with the first, pale light, the resonant call of guide or captain arouses the inert figures to another day of toil " 'Leve! 'Leve! Il faut partir!" Instantly, the camp is all astir. Utensils and blankets find places in the boats. As oars are set in motion, the chunk-chunk of bulky tholepins sounds eerie in the dawn. Someone strikes up an old French chanson, perhaps "La Belle Rose" or "La Petite Jeanneton," voicing in weird refrain the very spirit of the wastes. Night mists drift apart and gorgeous colorings mount the eastern sky; and, as the sun rides forth above the distant hills, cheerful breakfast fires blaze on some jutting headland.

So, through wind and wave, blistering sun and driving rain, the boats reached Norway House. On an island in Little Playgreen Lake, the northernmost arm



*One of the old York Boats under Sail. Photograph from the late Chief Trader Isaac Cowie.*



*The oarsmen enjoy a spell as a fair wind on Lac Bourbon enables the crew to hoist the sail. The steersman at his sweep. From an old photograph, the property of the late Judge Walker.*

of Lake Winnipeg, stood the stockaded clearing—establishment of all the inland trade. Here, from every compass-point, came the huge, fur harvests, to pass through Playgreen Narrows, on their long journey to the old-world markets—from Fort Francis on Rainy River in the east, Fort Vancouver at the mouth of the Columbia, Fort Pembina in the land of the Dacotahs, Fort Yukon and La Pierre's House beyond the Arctic Circle; while goods destined for distribution to the wilderness must needs pass hither. Swift canoes, manned by impulsive French-Canadians and fiery Iroquois, bearing the great administrator, Governor Simpson, and his retinue from Montreal, had for years travelled the long Ottawa-Superior route to this isolated capital of the wilds. More often here than at Fort Garry the Northern Council had assembled. From the uttermost regions of the northern continent—from Columbia, New Caledonia, Mackenzie, Athabaska, Saskatchewan, English River, Red River, Lac La Pluie, and other districts—the autocrats and grandees of a new-world feudalism had

annually gathered to do homage to their chief and break the monotony of their isolation. Here, in the great meeting-hall, were grouped the council seats of Rupert's Land and all the vague, licensed territory beyond; and, though four principal establishments of trade had been evolved in western British America, neither Fort Garry of the prairies, Fort Vancouver of the Pacific nor York Factory—the import and export emporium on Hudson's Bay—exceeded in importance nor equalled in the cardinal requirements of geographical position, independent isolation and accessibility by water from every side, the natural pivot-point of Norway House.

Supplies from the prairies were discharged; articles of trade from London, received through York Factory, were loaded; and, having indulged freely in the festivities and controversies attendant upon contact with long-separated comrades and rivals of other brigades, the Red River crews bid Norway House farewell and turned south-westerly toward the mouth of the Saskatchewan.

Where the combined waters from the farther plains and the eastern slopes of the Rockies foam and thunder down the Grand Rapids to Lake Winnipeg, the first, full test of ability and courage had arrived. Straining in single file upon the stout tow-lines till quiet eddies were reached below the rapids, the crews assailed the Grand Portage with proud show and rivalry. Immediately, reputations were at stake. Competitive merits of crews and individuals hung in the balance. Old trippers called impatiently for their loads; green hands, fearful of proving unequal, strove to emulate their peers; and, all laying to the task with characteristic agility and good heart, the transfer was completed to the upper level. Emptied of cargo, the boats were further tracked, hauled across the portage, and re-loaded. More than 200 miles of up-stream navigation now stretched westward by the broad highway of the Saskatchewan, the "Swift-flowing-River" of the Crees.

Making short portages at the Roche Rouge and Cross Lake Rapids, the brigade passed up the Demi Charge, the boats being tracked with half-loads, —and, wind being favourable, the river-widenings of Cross Lake and the enchanting Cedar or Bourbon Lake, the finest and wildest of the whole Saskatchewan, were traversed under sail. Hereabouts lay the conjectural site of the earliest explorer's fort in all these northern forests—a long-since-lost and all-but-forgotten outpost of the great Verendiye.

Followed the straggling Indian village and surrounding marshes of Chinahawin, the river wandering in low country through many channels; and, with cheerful prospect, the crews worked untiringly to gain the Kettle Island, a welcome and time-honoured resting-place amid a sea of swamp. Unobstructed water now lay westward for many miles, to the mission and trader's rendezvous of Le Pas, and on, past the Big Bend to Pine Island Lake and Cumberland House, the pioneer, inland post of the company, erected in 1773 by Samuel Hearne. Sending forward a boat with mail and merchandise, and to procure supplies for his men, L'Esperance turned northward from the Saskatchewan through Namew and Amisk

Lakes and the Sturgeon-Weir River, the men often waist-deep in water, tugging, heaving and pulling past difficult shallows and currents, toward the watershed between the Saskatchewan and Churchill Rivers. Coursing the Pelican Narrows between Mirond and Pelican Lakes, the slow-moving transport crept on and on; worn and weary from constant effort, the unflinching voyageurs reached the Portage du Fort de Traite—the "Athiquisipichigan Ouinigan" or "Portage of the Stretched Frog-skin." Here, Joseph Frobisher and Alexander Henry of Montreal, famous North West Company men, had built, in 1776, their farthest fur post, to control the Churchill, obtaining in that year many thousands of beaver skins, large quantities of otter and marten, and independence for life.

From the Frog Portage, for 100 miles and more, a veritable procession of rough waters and carrying-places confronted the crews. Between its sources on the mid-continental divide to its outlet in Hudson Bay, the Churchill or English River cleaves the wilderness for a thousand miles. Studded with lakes, turbulent with countless falls and rapids, bordered by continuous forests, replete with fish from royal sturgeon to fat trout, embracing on its flanks the habitat of the moose, caribou and wood bison, and teeming with all the fur-bearers of the northern zone, the Churchill stood pre-eminent among the coveted arteries of the fur trade. Up the long grind of tossing water, halting at occasional sub-posts of the company, surmounting many portages, tracking mile after mile—portage straps attached to tow-lines, browbands over bending shoulders, always in good humour, laughing at all mishaps, blistered, bruised and lacerated, the crews pressed on.

At last, the lonely Lac la Crosse was reached, and the hospitable Fort Ile a la Crosse, 500 miles above Cumberland. Welcome rest of several days preceded the final 100-mile stage to the Height of Land; and, in due course, with stout hearts, enduring spirits, and refrains that stirred the forest's depths, a lusty pull across the Methye Lake gained the famous portage of La Loche.

Each day of the arduous journey had varied little from the others; but each

had been replete with small adventures; and every day alike had made demands upon the stamina of every man. The disposition to see the droll side of passing incidents, the cheerfulness and boisterous fellowship, had made light of many dangerous situations. And even in the midst of impending difficulties—of boats stranded in mid-rapids, of sinkings and imminent drownings, overturnings, deluges, buffetings and accompanying injuries—the inherent tendency to mirth among the native boatmen had turned aside many a threat of dire calamity.

Since earliest days of inland trade, the Methye or Long Portage or Portage la Loche had been the contact-point between two vast realms of wilderness. The waters on the one side flow eastward down the Churchill to Hudson Bay; on the other, by the Clearwater and Athabaska Rivers and Great Slave Lake, they seek the Mackenzie, to flow northward to the dismal Beaufort Sea. Across the separating 12 miles of muskeg and sand and the dividing ridge, 800 feet high, lay the funnel of all the northern trade, occupying a position almost equidistant from the Rocky Mountains and the Bay, the Great Plains and the Arctic. The Long Portage stood in the very midriff of the land of fur; and two months had passed since *L'Esperance* and *Bruce* had set out from Fort Garry, more than a thousand miles away on the margin of the prairies. For as long, the brigades with winter catches from the

solitudes of the Athabaska, Mackenzie and the Yukon had toiled upstream to exchange their precious loads for the much-needed supplies and articles of trade brought inland by the two Red River guides.

And now, three burdensome weeks, under the midsummer sun, found the crews labouring at the carrying—going half-way with trade articles and provisions, returning with furs, the northern men reversing the order—till the last bulky packs were stowed for further transport. To stand with braced shoulders on the high prow of the beached York-boat, to receive the regularly-constituted load of two "pieces"—each close upon 100 pounds—to hop lightly to the ground and trot away, was alone a feat for seasoned carriers.

But rivalry became rampant. The more ambitious attempted the impossible. Common-place endeavours became fabled deeds. Goaded by taunts, many a reckless voyageur called to his steersman, to whom the duty belonged, to load and load again. The wiry Villebrun, noted for remarkable achievements, received six "pieces" on his marvellous shoulders and only with the breaking of the portage strap, after 700 pounds had reached his back, did he cease his mad craving for a "proper load."

To labour day after day against wind and wave and rapid, to essay a hundred shorter portages, to face always the capricious whims of the elements,



*York Boats en route near Norway House. From an old photograph, the property of the late Judge Walker.*



sufficed the bravest. But to work from dawn till dark, through the sweltering, fly-infested days under the sweating tump-line, to bend to loads that sank the leather deep in the swollen forehead and stiffened the throbbing neck and shoulders, was work for unconquerable spirits; and little wonder that the supreme test of manhood on the high-ways of the north should be the gruelling pathway of the Methye ridge. If the young and haughty voyageur had passed creditably the exacting ordeal of the Long Portage and all that preceded it, well might he parade his achievement on every festive occasion, and proclaim to all the world "*Je suis un homme*" . . . "*Je suis supérieur*," ("I am a man . . . I am superior,") for assuredly he had attained no mean prominence in his sturdy manhood.

Now, in the glimmering August days, as Nature paused to blend her richest hues, as broods of duck and geese grew strong of wing, and mossberries reddened in the cooling nights, loud farewells and merry laughter echoed over the Methye Lake; and, as the last boat vanished amidst the dreamy isles, the silence of the wilderness returned. The backbone of the long journey had been broken; but two-thirds of the distance yet remained. Running free, the freighted flotilla floated down swift currents and wide reaches till the Churchill and Saskatchewan had been left behind; and again the dipping prows ploughed Lake Winnipeg to Norway House. Upon the triumphant and hilarious return, the officers in charge of the busy depot might be hard pressed to maintain a semblance of discipline. Dancing and carousal involved rivalries and brawls; but fearless diplomacy ordinarily sufficed to remind revellers and disturbers alike of their contracted pledges. Four hundred miles of lake and river must be negotiated to the bay ere the company's barque, riding at anchor in York Roads, trimmed her top-gallants for the ocean voyage to London. And, again under way, the boats headed northward by Little Playgreen Lake and the easterly channel of the Nelson River.

A few miles down stream, the Sea River Falls was portaged, below which the course turned easterly by the narrow

Blackwater Creek. Bulrush Lake, near the divide between the headwaters of the Nelson and the Hayes, dwindled to a diminutive beaver creek of other days, whose rude dams were maintained by all who passed, to hold the waters in reserve as they seeped through marshy meadows to the western branch of the Echiomameesh—"Water flowing both ways." A short lift over the ridge of the Painted Stone brought the boats to the rush-bordered channel of the eastern branch, thence to Franklin's River (where the famous, ill-fated adventurer was nearly drowned in 1819); and, again, increasing water led the way to the White Fall or Robinson Portage.

Forced and imaginary rivalries, boastful bets and challenges, tended at all times to spur men and crews to incredible efficiency; but the inherent spirit of competition found its fullest scope between separate brigades on the constantly-travelled route between Lake Winnipeg and the bay. The Robinson Portage had long furnished the favoured arena for combats and feats of skill and strength that went to make or mar many a far-flung reputation. And the mile-long trail was only second in importance to the Long Portage. The novice who could undergo the panting run, without stop, with 200 pounds, till by repeated trips he had conveyed his 1,200 pounds from end to end, at once rose to the status of a first-class tripping man.

An entire day was needed to transport the heavy craft past the White Fall, the combined man-power of the brigade being applied to each boat in turn. The Upper and Lower Hell Portages followed, and Hell's Gate—a deep chasm too narrow for oars, the sheer sides towering nearly a hundred feet on either side. Reaching Oxford Lake and aided by the sails, the brigade cruised onward till Oxford House on its eminence above the eastern shore was reached; and here a brief halt was made in keeping with the proverbial hospitality and cheer of this half-way hostel of the wilderness. Again in the boats, following a night of feasting, merrymaking and dancing, in which the forest belles joined tirelessly, and assisted by increasing currents below the pleasant lake, the brigade forged on. Flashing in all the impromptu finery of gaudy shirts, gay feathers and scarlet sashes, donned





*Tracking York Boats up Franklin's River. From an old photograph, the property of the late Judge Walker.*

on the occasion of the previous night, and singing as they pulled the dripping sweeps, the crews boldly took the Trout Falls at top speed, each boat under the masterly guidance of its steersman plunging down the 16-foot cascade midst clouds of spray and loud acclaims. Sailing the full length of the island-studded Knee Lake to the main intake of the Hayes River, the men lounged about the boats or slept; while a few, still stirred by the spirit of the dance, pounded out the Red River jig on the bowstands to the discordant timing of battered fiddles.

Steadily the waters widened and at long last the great transport held the final highway to the sea. Swift currents bore the racing York-boats down innumerable rapids and cascades, between rock-bound shores and wooded isles, rich with autumn tints that glowed amid the spruce. Morgan's Portage, Rock House—an old depot for the first incoming Red River settlers in 1811—and Rock Portage were passed; and in due course the junction with the Shamat-tawa was reached. Thence spreading from 300 yards in width to more than half a mile, the Hayes rolls its gathered volumes to their destination, almost meeting, shoulder to shoulder, the wild

and tossing Nelson as the two mingle their contributions in the bay. Five miles in the rear of Beacon Point, on the spit of lowland between the two estuaries, stood York Factory, the approximate site of the initial fort—erected in 1682 by Pierre Radisson—the first to carry the banner of the Adventurers of England into the western wilds.

Life at the sea-port of Rupert's Land was at the zenith as L'Esperance, and soon Bruce, with their boisterous crews, arrived with added impetus and colour. Evidences of holiday and diversion mingled freely with the customary air of staid importance pervading the commercial centre of the great monopoly. Far out, at her anchorage in "Five Fathom Hole," the "Prince Rupert" rode the sparkling blue in graceful outline, dwarfing the smaller craft that plied shoreward and back with the exchanging commerce of the fur trade.

Along the waterfront, back of the tidal line, where York-boats, dories, bark canoes, smoke-wreathed camps and their equipments lay strung in the careless manner of non-permanency, the tenantry of the wilderness was depicted in its every phase. Swarthy denizens of the vast silences held carnival after their

simple fashion, or basked and fraternized in little groups. Pungent odour of "haw-rouge," the native red-willow "tobacco," suffused the air. Scolding beldames, raven-haired lassies, lithe-limbed youths, noisy children and slant-eyed dogs frequented the environs of every moose-skin teepee. Encampments of transient voyageurs rang with sprightly song and banter. Cree and Ojibway trappers, half-breed rivermen, French-Canadians, Orcadians, Highlanders, sailors, clerks and servants—even a sprinkling of Chesterfield Inlet Esquimaux—made up a northland picture significant of the time and place.

Trade and purchase, games of chance, competitions, feasting and dancing, sing-songs and brawls, filled the hours of day or night, the while the officers from land and sea pushed the transfer of import and export to completion.

In the forefront of the proud emporium, from a lofty mast-head, the united crosses of Britain fluttered in the breeze, bearing the magic "H.B.C.," the accepted symbol of protective power and square-dealing. On the open space between the river and the main enclosure, two pound cannon and four brass field pieces on raised platforms flanked the central entrance. Inside the pickets, the various quarters, workshops and warehouses buzzed with activity.

At the climax of the year's affairs, York Factory, costodian of the northern gateway, pulsed with absorbing business and enjoyment. But offshore winds bore threat of colder days.

All too soon, departure followed. Thunder of cannon rolled athwart the forests, as the laden barque, now decked in white, swung to her helm and stood to sea. Fort guns echoed the farewell. Canoes drifted away to distant trapping fields; and merchandise, loaded for Fort Garry and the distributing warehouses of Norway House, awaited the muster of the lean, tenacious crews. At last, in high spirits, with a will that knew no faltering, the opposing currents were assailed. September was on the wane. Once more, Lake Winnipeg was reached; and, aided by every following wind, the happy-go-lucky argonauts steered leisurely for home.

A crisp, October morning. Twelve travel-scarred York-boats, now in single fleet, swing up the muddy current to the "Forks." Every voice swells with the rhythm of the boat song; every ear thrills to greetings from the shore. As the toil-freed voyageurs scramble from the boats, hearty cheers resound below Fort Garry. Three thousand miles by inland water-route have been achieved! Draped in sombre garb, the land of plain and river quietly anti-



*An old picture of the famous Hudson's Bay Company Post, Norway House, on Little Playgreen Lake, taken by the late Chief Factor James McDougall.*



*And here the new. A bird's eye view of Norway House, of the Hudson's Bay Company, near the head of Lake Winnipeg, as it is today.*

cipates its winter sleep; and, heralding their clamorous farewells, great flocks of geese drift southward down the sky.

Upon the efforts of the two Red River guides and their commands hung, in large measure, the fortunes of the guttural Chipewyans and Loucheaux of the Athabaska and Mackenzie, the Yellow-knives and Dogribs of the wind-swept Barrens, the Esquimaux of the western Arctics, the Cree nation of forest and plain, the scattered tribes and fragments of tribes stretching to the Pacific, the buffalo hunters of the Missouri Couteau, labouring missionaries, officers and servants of the fur trade, and wanderers throughout the whole north-west.

Years have rolled away. A new generation has possessed the frontier. The Red River voyageur lives in the beyond. No more do the forests of the north ring with his cheery songs nor the silence of the lakes he loved awake to the splashing of his sturdy blades. Manitoba's inland waters beckon to the summer camper and the tourist. Steamers ply Lake Winnipeg from the old Red River Settlement to the fishing stations and lake-ports of the modern north.

Miners come and go by land and air, unfolding the riches of the great Laurentian shield. At the Churchill's mouth,

massive grain-elevators, linked to the prairies by bands of steel, mark a new outlet of agricultural commerce. At the "Forks" of the Red and Assiniboine, where the mid-continental metropolis of Winnipeg dominates the northern plains, few traces of pioneer traffic now remain.

A sumptuous hotel, commemorates and towers above the site of the "Fort Garry" of other days—effaced, save for a remnant-gateway of the palisades. The mother-structure of the prairies has vanished with the usage of a feudal age. Furs still find their way across the trading counters of the fur posts; but the venerable Norway House, still mindful of its youth, basks in the summer suns or dozes beneath the shrieking winter storms, to dream of the roaring years of high adventure. York Factory has become an obscure village.

Only in secluded byways or quiet havens of retreat appear the remnants of the once essential types of men whose very existence made possible the conquest of the wilderness. Soon, all trace of these will have crossed the Great Divide. But, ever in the picturesque haze and dim perspective of their wild environment, the intrepid carriers of the Long Portage will loom in the forefront of pioneer romance.



*Crimson Fire Weed*

*A distant cousin of the English primrose, Milton's "Primrose that forsaken dies."*





*Pansies from Dawson.  
"There is pansies, that's for thoughts."*

## Yukon and Her Flowers

BY MRS. GEORGE BLACK

SINCE the first discovery of gold in sensational quantities was megaphoned to a startled world in 1898, Yukon, or as it was then called, the Klondike, has intermittently been front page news. It may have been the O'Brien murders, or the one and only hold-up in a Dawson dance hall, the enormous number of men per capita of the population who enlisted to serve "King and Country" in the Great War, the discovery of fabulously rich silver-lead ore in the Mayo-Wernecke district, or, more recently, the epoch-marking flights of Wasson and Walsh in their aerial search for the Burke party, with the discovery

Wife of the Speaker of the House of Commons, and an authority on Yukon flowers, having spent a number of years in that region when her husband was Commissioner of the Yukon Territory. Her specialty is the pressing and mounting of flowers "I do not," she says "pretend to be a botanist in any sense of the word — I simply love that part that I have dubbed artistic botany."

rewarding their labours of Burke dead, his two companions living. But all these and other stories feature that northland as grim, forbidding, treacherous and cruel. Nowhere do we find mention of the fish-teeming lakes, the game-trodden

forests, or the mountains, plateaus and natural pastures covered with the most abundant and beautiful flora of the North American Continent.

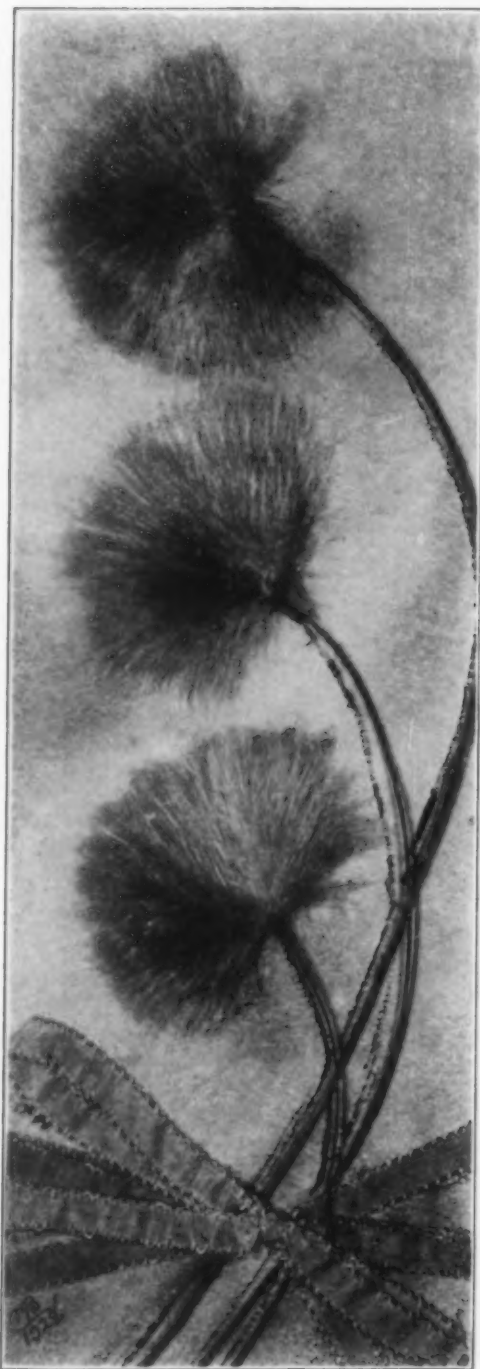
The most thickly-settled community may be cruel to the ignorant, the idle or the helpless, but in Yukon there is always a living to the man who works and who studies her moods. There is wood for the cabin and fire



*Purple Pasque Flower.*

*"Throw hither all your quaint enamell'd eyes  
That on the green turf suck the honied showers  
And purple all the ground with vernal flowers."*





*Sheath Swamp Grass*

*"The meanest flower that blows can give  
Thoughts that do often lie too deep for tears."*



*Hudson Bay Tea.*

*Also known as Labrador Tea. Used by travellers  
and fur-traders as a simple medicine.*

for the cutting, there are fish for the angler, birds of the air and big game for the sportsman, while to the farmer the soil is rich in potentialities. All who know how and are willing to work, given ordinary health, may wrest more than a good living from that country.

In the days of '98 when we were climbing the sheer and slippery sides of the Chilkoot our thoughts dwelt only



*Splachnum Moss.*

*Of all the exquisite mosses which cover the ground none is more beautiful than this.*

on the gold to be plucked from the grass roots, though it was at Dyea in the spring of that year I first saw the wealth of blue iris that carpeted the lower hillside and flats of that temporary, tented town. From then on I was always on the lookout for flowers that were strangers to the mid-west and eastern mind.

In no way pretending to scientific botanical knowledge I have grown to



*Autumn*

*Bright painted leaves, heavy laden seed grasses, and silky tufts.*



*Yellow Lady Slipper.*

*"Golden slippers meet for Fairies' feet."*

know, and love, the flora of the Yukon, and in one year it was my good fortune to gather, press and mount 464 varieties of flowers and ferns, classifying them with the assistance of friends. To Dr. Macoun and Dr. Malte I owe a debt of gratitude for their patience with my ignorance, while I can never forget the kindness shown me by Mrs. Julia Henshaw the summer I spent in the mountains of British Columbia making a collection of mountain flowers for the Canadian Pacific Railway Company.

As a child I was a dreamer and oft-times emulated Robert the Bruce by watching the industrious spider, though failing to develop much industry myself. In the course of time I became the despair of my teachers and especially of dear old Sister Sophia of the Holy Cross who tried so hard to teach me the scientific part of botany. Finally finding it was hopeless she suggested that the

making of an herbarium might be a pleasure instead of a hardship. Like a stone cast into a pond the thought thus given my youthful mind broadened and widened through the years until to-day the greatest pleasure I have is following out the work that, for want of a better name, I have called artistic botany.

The coast of Alaska, as well as the interior of that territory, and Yukon, are prolific with Arctic and mountain flora.

Back of Juneau, at the foot of a great glacier, there are acres of the silvery swamp, or cotton grass as well as the rarer golden beige, while bordering the road from Juneau for 15 miles the ground is covered with blue lupine and the edges of the small streams crowded with the dainty blue forget-me-not. It may interest some of my readers to know that in Texas the lupine is known as the bluebonnet, and is the official flower of that state.

In Skagway the flats bordering the small streams that cross and recross the town are crowded with the golden glory of the marsh marigold, with blossoms in many instances the size of the yellow pond lily.

The chocolate or bronze lily, one of the frittarlarias, grows in profusion on the outskirts of the town.

It is, though, as the White Pass train climbs above the old trail of '98 that one notices the change in the flora, gradually leaving behind the growth of the coast with its sumach, wild raspberries, currants, the scarlet and yellow of the swaying, feathery columbine, the lilies and sedges, and find instead the ground covered with heather (why do botanists call it "false"?), the ground pinks and a wide range of saxifrage.

Early in March in Yukon the first harbingers of spring are to be found in the soft willow buds, or "Pussy will yous," as a tiny friend of mine once called them. For three or four weeks the

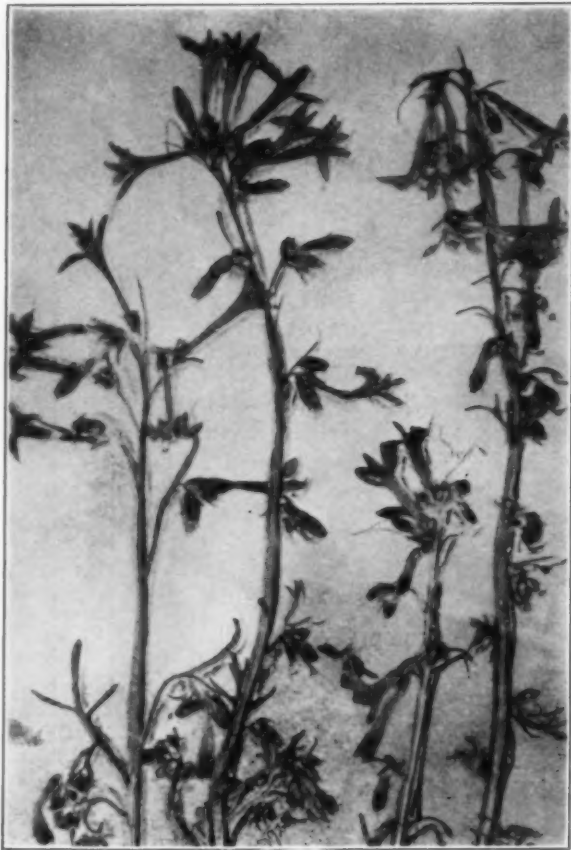
flower seeker must perforce be content with these dainty pieces of down, but from early April there will be no limit to the floral surprises to be found in this golden Yukon.

No rocky pile must be deemed too forbidding, for oft-times, sheltered by the sun-kissed side of some giant's foot-stool, will be found our first spring flower, locally called "purple crocus" but in reality the dainty pasque flower (*Anemone Nuttalliana*) so commonly found in May in the valleys of the Canadian Rockies near Banff. The flowers are like the ordinary garden crocus in appearance, save as they are protected from inclement weather by a soft hairy down. The peculiarity of this member of the crowfoot family (*Ranunculaceae*) is the growth of the foliage after the flower has blossomed. As the purple sepals fade and fall the seeds form, and then the head presents a beautiful plumose appearance, for to each seed is attached a long, silky tail, the whole forming a pretty feathery tuft.

Closely following the pasque flower I have found 11 other members of the *Ranunculus* family varying in size and colour from the tiny yellow water crowfoot, commonly skirting the edges of sluggish streams and pools, to the longfruited *Anemoneae* with dainty white blossom shading into delicate greens, blues and pinks.

The floral colours of the north are largely blue, pink and magenta with a generous touch of yellow in the arnica, shrubby cinquefoil, marsh marigold, yellow pond lily, Arctic poppy, mustard, golden corydalis, yellow violet, vetch, Drummond's *Dryas* (both white and yellow), loco weed, stone crop, ragwort, hawkweed, monkey flower, and many other blossoms whose names are familiar to all.

The dandelion in Yukon, as elsewhere, is ubiquitous, while in many places the eastern buttercup has in recent years



*Scarlet Gillia.*

*"When spring unlocks the flowers to paint the laughing soil."*

grown, spread and thrived. Both flowers were probably brought in with bales of hay and other fodder.

In all my rambles throughout the Yukon I have never found genuinely scarlet flowers. I do not say that such colours do not exist there, only that I have not found them. The Indian paint-brush that on the prairies and in British Columbia ranges in colour from a brick red to a beautiful cherry is in Yukon either a sickly lemon or a homely magenta, while the columbine with us is usually blue and lemon, though I have found a sport of purest white.

In June acres of ground from Carcross to Forty Mile are covered with the purply blue lupine with an occasional pale pink or pure white sport, the wild Arctic poppy (a pale lemon colour) and the Jacob's ladder, most unkindly called





*Indian Paint Brush.*

"Scarlet tufts are glowing in the green like flakes of fire." But they are not scarlet in the Yukon.

"skunkweed" from the disagreeable odour.

On the higher hills between Keno and Wernecke the dainty mountain forget-me-not grows cheek by jowl with the pink snakeweed (*polygonum bistorta*), the mountain hare bell, the brilliant cerise shooting star and the shrinking penguicula (frequently mistakenly called "mountain violet").



*Franklin's Orchis.*

"Full many a flower is born to blush unseen  
And waste its sweetness on the desert air."



Lower down the mountain side the saucy Dutchman's breeches, the bleeding heart, a tiny prototype of the cultivated variety we all knew in our grandmother's gardens, all these and many more are upon us in a bewildering array as soon as summer sets in with almost 24 hours of daylight.



*Jacob's Ladder.*  
Unkindly called "skunkweed" because of its disagreeable odour.



*Monk's Hood.*  
Among the countless lovely wild flowers which spread their colourings in the Yukon summer landscape.



*Crane's Bill.*

*Of the same family as the flower we remember in old-fashioned gardens as the Geranium.*

The pyrolas, or shin plants, are exquisite in their waxen beauty, the single star blossom alone (*moneses uniflora*) giving forth an almost intoxicating fragrance.

The tiny twin flower, or *Linnaea*, the favourite of Linnaeus the "Father of Botany", carpets our woods and perfumes the air.

If one enjoys watching a floral cannibal at work during the drowsy summer days when tiny midges are in the air, then the sundew (a distant relative of the Venus flytrap) will give ample amusement. The small, flat leaves of the plant are thickly covered with long sticky hairs that reach forth and gather the unwary midge, literally sucking the life fluid from the unfortunate insect while the leaves bloat and swell during the banquet.

An almost infinite variety of vetches intrigue the eye, from the golden rock vetch to the wonderfully brilliant magenta flowering vine that makes such vivid spots of colouring along the banks of the Yukon during the months of June, July and August.

One cannot speak of the flowers of the Yukon without making special mention of the great variety of orchids to be found there, the most common being a white orchis with large purplish-pink splotches. It grows on sandy, sunny hillsides as well as on lower levels, usually one flower on an erect stem with two or three sheath-like leaves.

The Siberian orchis, or Franklin lady slipper, so-called as it was first named botanically by the botanist of one of the Franklin expeditions, is not so attractive. The sac without is pure white, within covered with purple spots, small, irregular, while the overhanging lip is green, but the two wings are pure white.

There is an occasional pure-white orchid, an exquisite single flower exhaling a faint though delicious fragrance, surrounded by long, acute bright green leaves, a rare find even for the experienced botanist. I came just once upon a clump of three of the blossoms.

The fragrant bog orchid, the fly-spotted orchis, the dainty little coral root, the lady's tresses and the Calypso

(said to have arisen from the tears shed by that goddess over the departure of the fickle warrior Ulysses) all grow within a few minutes' walk of Dawson, and many of them just under the frowning brow of the "Slide" around which so many mystic tales are woven.

Exquisite mosses cover the ground everywhere but none more beautiful than the *splachnum luteum*, the moss growing in thick, short masses, while the tiny yellow floret rises to a height of from one to 10 inches on a red-hair-like stem. Lucky indeed is one to discover such a treasure.

The thoughtful housewife stocks her winter larder with jellies, jams and preserves made from the fruits that grow wild in great profusion all over the territory; strawberries, currants, blueberries, three varieties of the low cranberry as well as the high bush cranberry, red raspberries, roseberries and gooseberries. The preserve made from ripe wild rose haws equals the guava jelly.

Do you like mushrooms? Then come to the Yukon where huge pails-ful may be gathered in the early summer morning hours. There are no poison weeds or flowers to disturb us in that country.

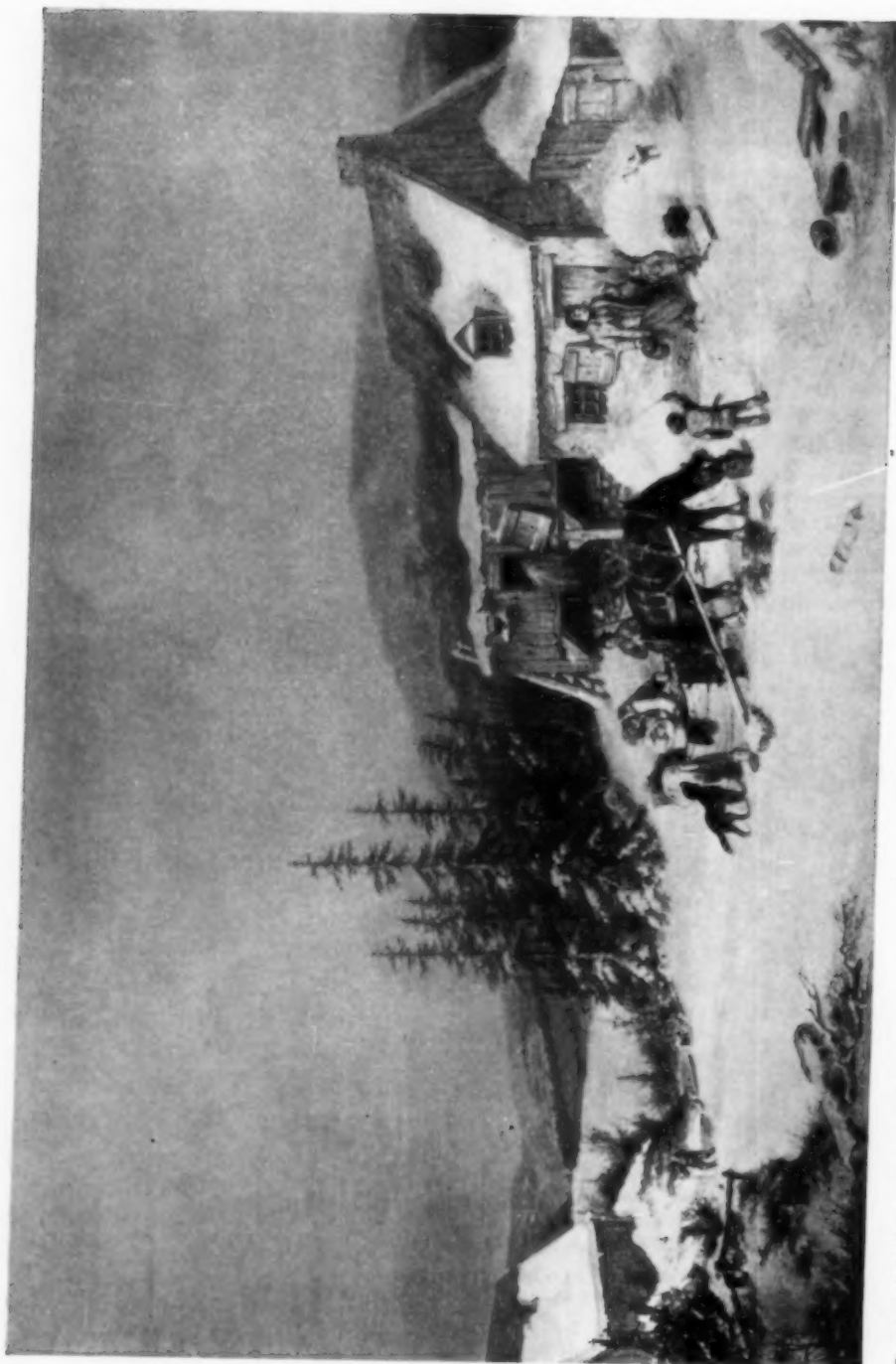
It is with a feeling of sadness that in late July we look over the distant hill and mountain sides and see the gorgeous magenta-purple of the great fire weed colour the entire landscape, border the roads and trails, for that flower more than any other tells us that "winter comes."

To tell the story of flowers to be found in Yukon would be to paint a pen picture that would tax the belief of those who have not seen, but to the traveller within our magic land I would say: Pause, and while you are listening to the golden story that our dredges and hydraulics pour forth, stop a moment to heed the mystic tale of the birds, the butterflies, and most of all the flowers that spread their vivid colourings on the summer landscape, from the glory of the early pasque flower, the fragrant wild rose, the lilies and orchids of our valley to the day when autumn draws a curtain of yellows and scarlets over the country soon to be covered with the diamonds and crystals of the northern winter.



*Pink Fire Weed.*

"A goodly and stately plant, garnished with brave flowers of great beauty."



Courtesy of the National Gallery, Ottawa

**"THE HABITANT FARM"**  
*A Winter Scene in Old Quebec.*

*From the painting by Cornelius Krieghoff*



# French-Canadian Handicrafts

By ALICE MacKAY

FEW aspects of Quebec life are more pleasing to observe than the revival of the old French-Canadian handicrafts. Habitant chairs and home-spuns of wool and linen have once more an honored place not only in Quebec homes but in many of the Early American rooms of the United States. The fine work of pioneers has been revived under skilful direction within the province's Department of Agriculture; old patterns have been searched out, encouragement given to workers throughout the province, so that old craftsmanship once more has become a not inconsiderable industry, of practical and spiritual value.

Quebec has a school of handicrafts, and, aided by organizations and interested private individuals, has given scientifically directed aid to the industry. Numerous exhibitions outside as well as within the province have demonstrated the development of a fine artistry. These exhibitions have consisted of hooked rugs, bed spreads, Murray Bay blankets, linen towels, luncheon sets, catalogue rugs, mittens, socks, the ceinture fléchée, hand-woven linen, wool and carpet by the yard. Definite standards of work are maintained, with definite reward for merit. Research into old methods of dyeing and forgotten designs have added value to the work.

The linen for towels and luncheon sets is now woven from flax grown upon the very farm where the cloth was made. The wool comes from sheep roaming the rocky country of the Laurentian foothills. The very dyes are commonly made and mixed by the weavers from vegetables and wild plants and berries.



Born in an Ontario manse, Mrs MacKay was on the editorial staff of the Ottawa Journal for several years. She has given much attention to the development of home industries in Quebec.



It is difficult for the city dweller to visualize this industry, which requires no factories, no stated hours of work, and which entirely produces the finished article within a few square miles of somewhat wild country bounded by the blue Laurentians and the vast sweep of the mighty St. Lawrence. Some of the finest workers do not even use patterns, weaving their ideas as the threads unroll.

Most of the work is done by women. In many homes in the valley of the St. Lawrence weaving is at the same time their recreation, one of the chief means of livelihood, and the main motive of the entire family, which is

usually large. It is easy to understand why this is so. The nature of the work is so deeply suited to the country and to the women who live upon it. They have little connection with the outside world. Their only social exchanges are with scattered neighbours, and all are centred upon the parish church. Those who live upon Ile d'Orleans and Ile aux Coudres (two islands where some of the finest work is done) have their horizons entirely bounded by the St. Lawrence, and are undoubtedly affected by their insularity. It is only natural that they have found outlet and expression through the patterns of their cloth, and that the finer craftswomen have had their ideas and skill recognized in the outside world.

These women have large families, and from an early age all help with the weaving. The boys tend the sheep, and the business of shearing, wool washing, combing, spinning the yarn, dyeing it, and the final weaving of fabric are diversions for small folk of both

sexes. The baby sleeps peacefully in its cradle, lulled by the soft rhythmic clatter of the loom, and if he awakens, mother and grandmother and big sister are right there, and the play of their fingers as they work fascinates him into perfect behaviour. In summer the machines may be moved outdoors close to the roadside, and the family works in the healthiest surroundings. In winter the warm attic accommodates the home industry and the air is sweet with the smell of dried apples and corn and fragrant herbs.

The background of the whole homespun industry is the Murray Bay blanket. This rug, with its light weight, its pure wool character, and its pastel shades, is perhaps the most characteristically-Canadian article offered to the tourist. For many years the casual traveller on the lower St. Lawrence has been buying these famous blankets which carried the name of the district to all parts of America.

Canada Steamship Lines, noting the popularity of homespuns among Manoir Richelieu guests and travellers on the

river ships, undertook to enlarge the market for the material and at the same time to raise the standard of quality. For this work, the hearty co-operation of the Department of Agriculture of the province was secured, and today these two agencies are working hand in hand to secure the most superior types of work and the most favourable market for these home products. The government was able to bring much talent into this work. Effective research was carried on, and it was found that many of the oldest patterns, embodying real beauty and local symbolism, were all but extinguished, and the farm women were showing a regrettable tendency to find designs in the more inferior forms of mail-order advertising. Examples of the finest old work were secured and given as patterns to the most capable women. Canadian artists were employed to create suitable Canadian motifs. This work has progressed so successfully that in Quebec City today is a school of instruction for handicraft workers which has only one rival in the world—the famous school of handicrafts in Stock-



*In this log cabin grandmother and mother are at work at a wide home-made loom.*



*Around the kitchen stove, the women of the family are busy at spinning wheel and frame.*

holm. Here classes are conducted for instructors, and during the summer months nuns from the convents in all parts of the province receive lessons and practical demonstrations in these old domestic arts. Through them is being actively accomplished a 20th century renaissance of old Quebec handicrafts.

A fair portion of the 5,000,000 pounds of raw wool from Canadian farms which annually goes into the making of fabric, mittens, knit goods, rugs, and the like, is used in the Province of Quebec. The gray homespun which clothed the French farmer and his family have given way to materials of great beauty of texture and design. The old homespun patterns sometimes were stereotyped. Now, thanks to provincial encouragement, workers have a great variety of design and colouring. Weavers can change from the plain, right-angle type of weaving, to the "serge", which gives a diagonal effect, the herring-bone, a combination of plain and serge, or the basket-weave.

To quote from Professor W. Carless of McGill University: "The tufted weave is a very characteristic craft with the habitant, and, like many of his ancestors, came from Brittany. The tufted pattern is woven as the work proceeds, it being formed of differently coloured strands of the weft, and is not added afterwards as might be imagined from a first glance. The designs in this tufted work are very quaint, some showing the influence of the old regime in the fleur-de-lis, or of the Church in the conventional figure of the Virgin Mary—"little Marys," as they are sometimes called. One also finds conventionalized fir trees, and a great variety of continuous patterns which are the result of the whim or fancy of the worker and the nature of the material to hand.

"The varied colour texture, which is one of the most attractive qualities of these homespun, is the result of differently dyed wools being mixed together before they are carded, whilst another reason for the same effect is the custom

of spinning different coloured strands of wool together when two or three-ply yarn is being made.

"The dyes used give beautiful soft shades owing to their being made from plants growing in the countryside. The leaves of the onion, the golden rod, spinach and willow stems, for instance, give yellows and greens; the blueberry gives purple, and the alder tree, black and brown. The different shades are arrived at according to the amount of boiling and the particular mordant used, for which copperas, salt, vitriol and common lye are the most common. For blues, aniline dyes are nearly always used."

One of the crafts which narrowly escaped extinction is the making of the ceinture fléchée, that gay sash of many colours which the French-Canadian loved to wind about his waist in winter. Old sashes have become greatly enhanced in money value, being sought

by collectors. Now their making has been revived, to the delight of winter sportsmen. The ceinture fléchée is not woven, but is braided in patterns of blue, green, red and yellow, so finely done that the effect is dazzling.

How varied are the rugs for floors and coverings is shown in the accompanying illustrations. The blankets illustrate all types of the best handweaving, and almost all possible combinations of various weaves. The colours are beautiful, and the fabric made for a lifetime of wear.

Rugs give the curious some insight into the lives of the weavers. Motifs are taken from the women's homes and surroundings—the things that seem most important to them. One finds, of course, the domestic animals. A remarkably fine and attractive pattern is the conventionalized bee and the maple leaf. This is one of the designs rescued by the research workers from near-oblivion.



*A wide variety of patterns are introduced into rugs and spreads.*





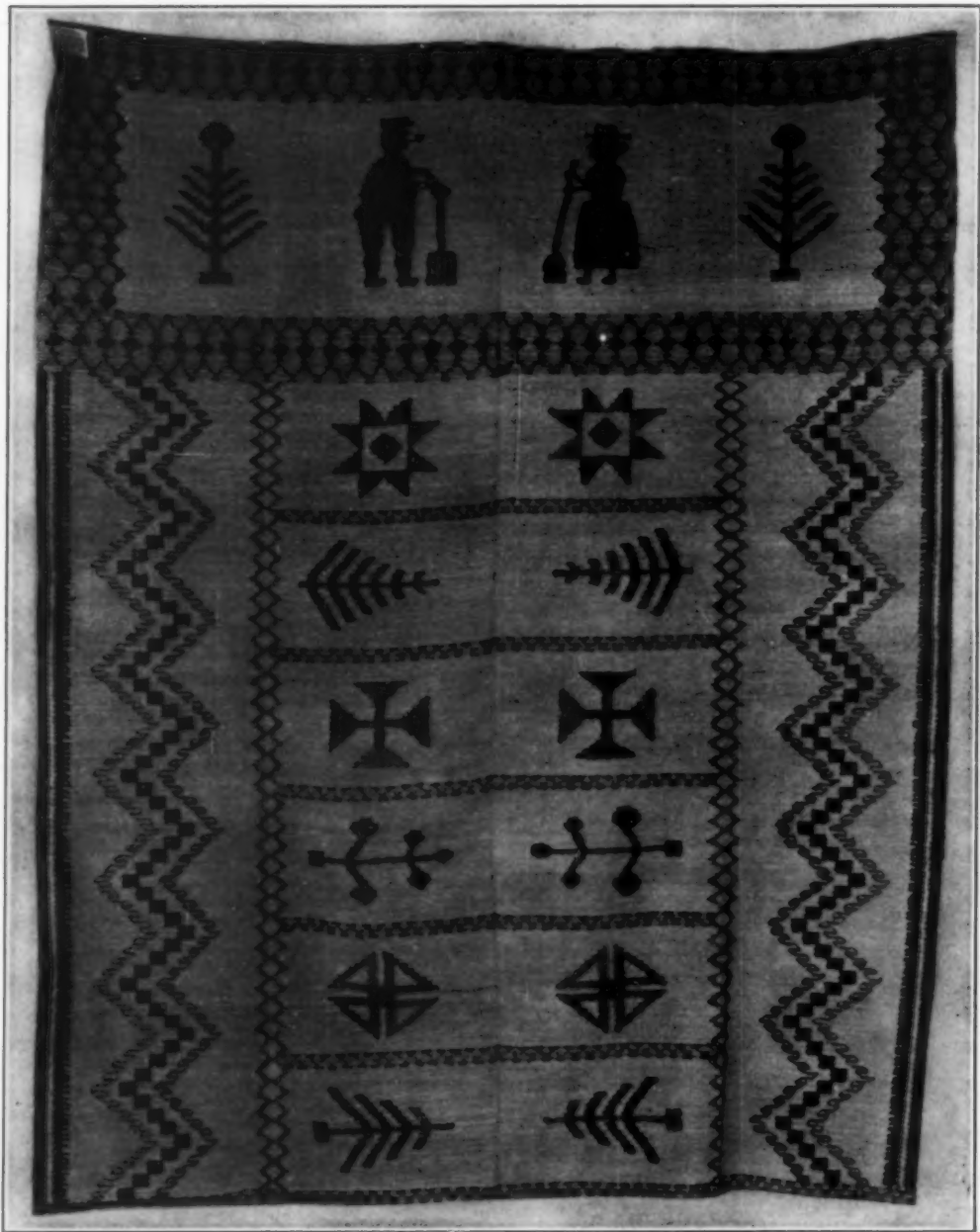
*All generations are familiar with the craft. This small boy is helping his grandmother with the spinning wheel and home-made reel.*

The devout worker produces in a hooked rug a quaint picture of her church. Many have gay replicas of their own homes—truly Canadian pictures. There are glimpses of the St. Lawrence with the lighthouse on the shore and miniature ships passing by on white-capped waves. A charming bit for a nursery is a round rug displaying two white rabbits and a green branch. A tapestry-like spread has the farmer, pipe in mouth, leaning on a hay fork, his wife close by, shovel in hand. One of the most national in character is the conventionalized pine tree.

These French-Canadian women are making a quite remarkable contribution to the national culture. Fortunately for them, for their province and for

Canada their art has not been allowed to dwindle into obscurity.

It is curious that in their peaceful, white homes along the St. Lawrence River, there has survived so strongly an occupation essential to pioneer Canada. A hundred years ago most farms had acute need of the spindle and the loom. Handwork was necessary for everything. Today, many of the original pioneer homes of Quebec's sister province, Ontario, have electric power for all kinds of modern household equipment. The people wear "store" clothes, and the household linen and woollens come from great manufacturing houses. They tour in their motor cars and come home to the radio which links them closely with all the outer



*An unusual and very old pattern of bedspread in red, yellow and green wool on a natural linen background. The farmer and his wife with shovel and broom, and a conventionalized design in which the pine predominates.*

world. They are not isolated. Many of their sons do not remain on the farms. Daughters seek occupation and education in the larger cities. Father and mother look forward to retiring to town or village life.

Not so in rural Quebec, where farming is an hereditary calling, and where the struggle with nature remains primitive. The people still build their own quaintly-attractive homes of stones or logs. Fields are separated by rough fences

*The making of the ceinture flechée requires the utmost patience and skill, a craft which was almost lost but has been rescued through the efforts of the school of handicrafts in Quebec city.*



made by hand. Modern conveniences are not regarded as essential or even particularly desirable. Here is a people content with a simple life, grateful for health, and faithful to the religion which is their strongest guide.

The peaceful monotony of the spindle and the loom is a natural pursuit for these people whose hands are never idle. While their men do the heavier farm work, the women spend their spare time working up the flax and wool. Many hands quickly accomplish the necessary household tasks, and then the women are free for their main business. It is a long, slow process making beautiful things from the flax in the field, and from the long, woolly coat of the sheep with

its tangle of burs. Only the patience of people attuned to a slow tempo could accomplish it.

Fortunately, with sound backing, the making of the Murray Bay homespun blankets, the spreads, the rugs and the linens for all sorts of uses, is now commercially quite profitable. Yet for handwork, prices are surprisingly reasonable. It is an industry which will undoubtedly grow, since there will always be a strong demand from the discriminating for such decorative things. Those more closely associated with this work must feel particularly gratified that something of the loveliness of the valley of the St. Lawrence with its background of mountains, is tangibly given to the outside world.



Canada Steamship Lines Photograph.

*Washing and combing the wool after the shearing. From sheep to finished article, all processes are completed within the narrow bounds of the farm.*



# Romance of Water-Power

By H. E. M. KENSIT, M.E.I.C., M.A.I.E.E.

ROMANCE is defined as "fiction" but also as "that which appears strange and charming." The rise of the development of water-power may justly be called a romance in the latter sense, a romance because of its small beginnings and its rapid rise to the present spectacular heights, because it has conferred population, industry and prosperity on many regions that would otherwise have remained deserted or poor, and because it has extended its benefits to nearly all portions of the habitable globe and even well within the Arctic Circle. It is the object of this article to present a general review of these aspects. Romantic as the story of water-power is, it must nevertheless be supported with figures, for in no other way can a definite conception be given of the immense range of its services and the magnitude of its development, yet within the permissible space only a few of the highest spots and only a few of the more interesting but lesser-known aspects can even be touched on.

Water-power is an inexhaustible and non-depletable source of energy in large quantities; the only other inexhaustible source at present known is wind, intermittent and variable and available only in small amounts. All other principal sources of energy, coal, gas, oil, are exhaustible and non-renewable and in using them we are depleting our capital. Water-power alone is endlessly renewed by the world-wide cycle of evaporation and rain.

The commercially-useful power available from a stream, assuming sufficient fall or "head", depends upon its continuous dependable flow. In a state of nature this flow is usually alternately wasted by flood discharges and diminish-



Born in England in 1885, graduated with honours in electrical engineering. Came to Canada in 1908, where he has carried out several important investigations. His home is in Ottawa.

ed by droughts, so that the minimum may be but a small fraction of the maximum. In the case of the Colorado River, for instance, the development of which commenced in September 1930, the flow varies from 3,000 to 250,000 cubic feet per second. Man, however, has learnt to improve these conditions. By means of storage and regulation dams, on the tributaries as well as on the main streams, he creates great natural reservoirs or lakes to conserve the floods for use over the period of drought, and by these means he can, in some cases, several times

increase the regular and dependable flow.

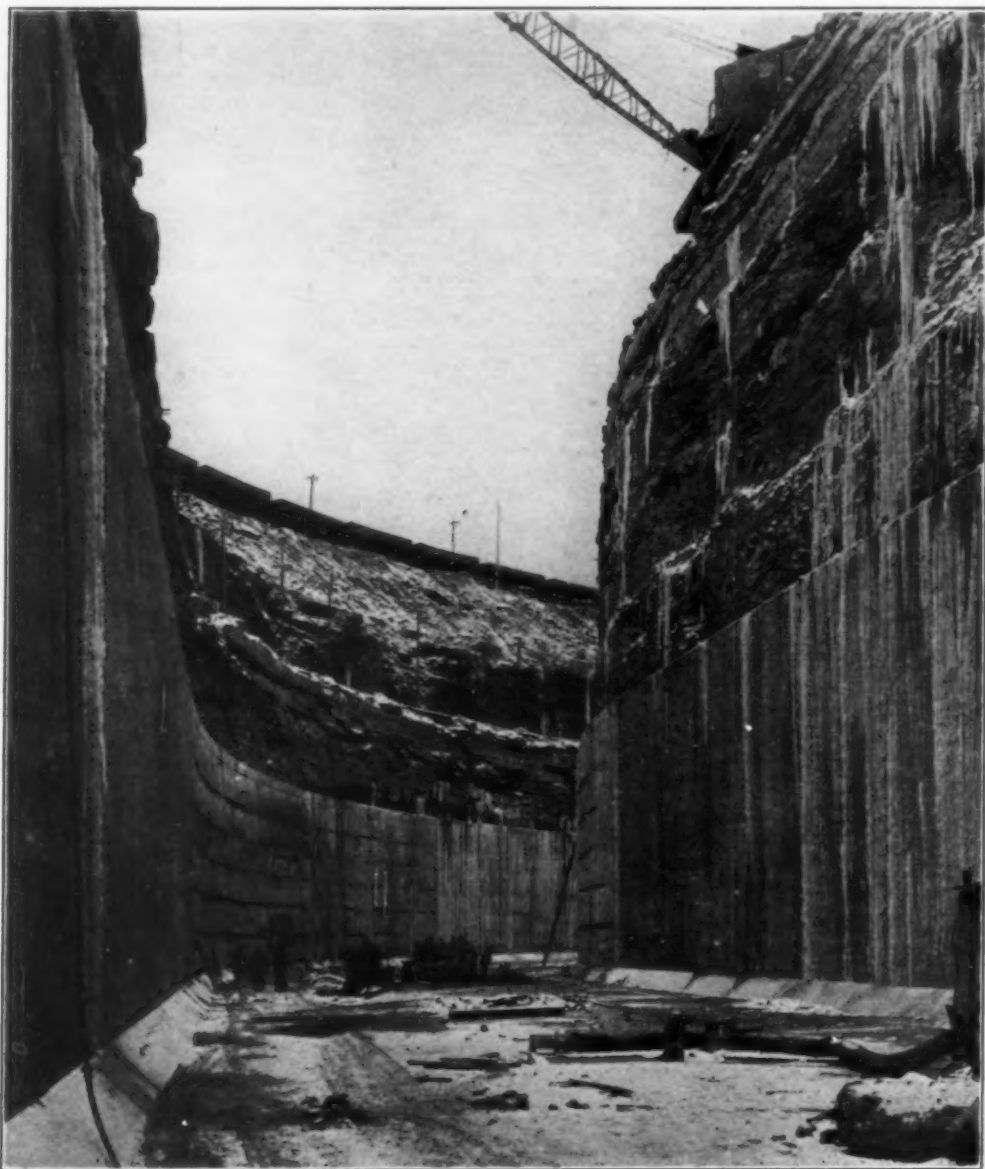
Furthermore, by study and skilful surveying and planning, he has learnt to make the maximum beneficial use of a river, that is to use the same water again and again by the carefully co-ordinated development of a number of sites on the same "power reach" of a river, the whole of the water being still available for irrigation or perhaps for still further power utilization farther on. The extent to which the power available from a river in a state of nature can thus be increased by dams and by intensive study of the most advantageous method of development as a whole, is almost incredible. Some examples will be found in the following descriptions.

Thus man, furnished by nature with a non-depletable source of power, has not only learnt to utilize this at high efficiency, but has in effect multiplied the original gift of nature many times over, and in so doing has extended the non-depletable feature to the larger amount.

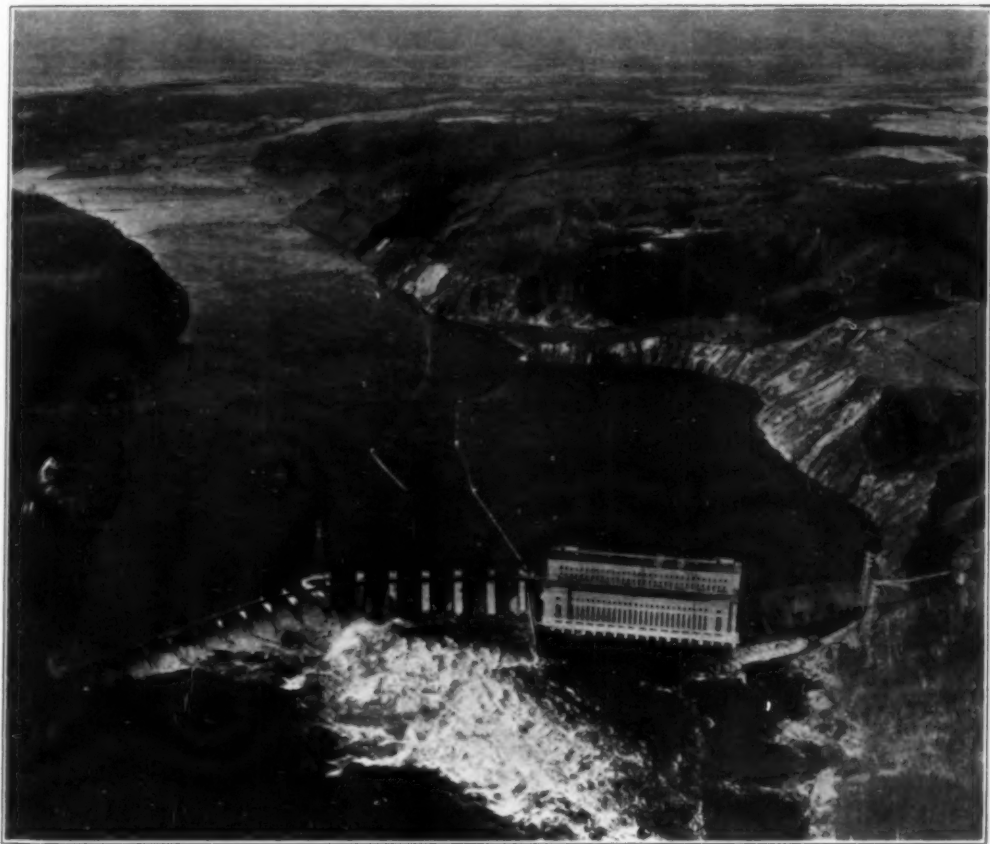
The use of water-power, in the sense of elementary water wheels, dates back to prehistoric times, but the "develop-

ment of water-power" may be considered to date from the invention of the reaction turbine by Fourneyron in 1827, a type of machine that made possible the development of larger amounts of power from higher heads, but no great progress was made until electric generation and trans-

mission became available. The first hydro-electric plant with transmission is stated to have been that at Lauffon, Germany, in 1891, and other plants of 100 or 200 horse-power soon followed, so that the hydro-electric industry may be considered to be about 42 years old. By



*Canal constructed by the Hydro-Electric Power Commission of Ontario to convey water from Niagara to the power station at Queenston, giving about twice the head available at Niagara. Total length 12¾ miles—rock section over 7 miles. The cut shows the canal at Lundy's Lane curve, the floor being 140 feet below ground level.*



*Aeroplane view of the La Gabelle development on the St. Maurice River, Quebec, of the Shawinigan Water & Power Company. 150,000 horse-power.*

1895 three 5,000 h.p. units had been installed at Niagara and energy was transmitted a few miles at 11,000 volts. Since then progress has been rapid, and now units have been constructed of 84,000 h.p. each, 17 times as large as the original Niagara units, individual plants are under construction of 1,000,000 h.p. each and more, energy is transmitted hundreds of miles at pressures up to 220,000 volts, and even greater pressures are proposed. The volt is the unit of pressure and there is close analogy between the flow of electricity in a wire and the flow of water in a pipe.

Water-power development often brings or coincides with many other far-reaching benefits made financially possible by the sale of the power. The dams are often in conjunction with locks that improve navigation, the lakes created

by the dams often form desirable recreation resorts, the surplus power for which there is no other market at the time is used on a large scale for the production of process steam in electric boilers at less cost than by fuel, and after all the water has been used to develop power it is still available for domestic and commercial water supply or for irrigation.

We may now proceed to briefly review the water-power resources of the world and the amount developed.

The following table shows the estimated potential horse-power of the world at ordinary low water and includes that already developed. North America has been subdivided in order to show the amounts in Canada and the United States:—

North America:		
Canada.....	20,300,000	
U.S.A.....	35,000,000	
Mexico.....	6,000,000	
Other.....	5,700,000	
	67,000,000	14.7%
South America....	54,000,000	11.9%
Europe.....	58,000,000	12.7%
Asia.....	69,000,000	15.2%
Africa.....	190,000,000	41.8%
Oceanica.....	17,000,000	3.7%
	455,000,000	100.0%

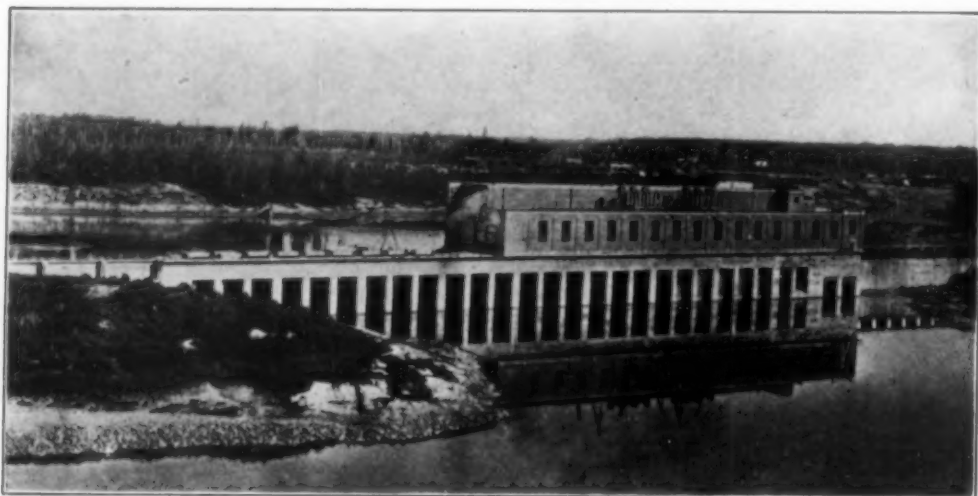
It will be seen that the greatest water-power resources in order of their magnitude are in Africa, Asia and North America. It is also of interest to note that those of Europe, popularly supposed to be comparatively limited, are greater than those of Canada and the United States combined.

The most remarkable figure is that of 190,000,000 h.p. in Africa and this includes the greatest power river in the world, the Congo River in Belgian Congo in Central Africa. On the authority of the United States Geological Survey, the drainage basin of this river covers 1,500,000 square miles, the tributary streams are themselves large rivers with great opportunities for the development of water-power, and on two stretches alone of the main river more

than 100,000,000 h.p. could be developed, though the engineering difficulties would be considerable. It is estimated that more than one-fourth of the potential water-power of the world is in this one river basin. At present there is, for obvious reasons, no development, but it gives food for thought, that only about 500 miles away, in equally remote and little-known Nigeria, the Nigerian Electricity Supply Corporation has developed 6,000 h.p. on the Gnar River for tin mining and is planning the development of a second site.

The total amount of water-power developed in the world by the end of 1931 was approximately 50,000,000 h.p. This, however, is installed horse-power and cannot be directly compared with the amount "available" since the plant installed may for various reasons be about a third more than this. The developed power is actually only about 5 per cent of that available. To tabulate the amount developed for all the countries for which it is known would require about 70 entries, many of them small, and it is sufficient for a general view to consider only those countries which have 1,000,000 horse-power or more developed, as these account for about 90 per cent of the total.

The particulars must be considered approximate, but they are sufficiently close to fairly represent the relative



*Slave Falls development of the City of Winnipeg on the Winnipeg River, Manitoba. Ultimate capacity 96,000 horse-power.*





Bureau of Reclamation, photograph.

*Shoshone dam, Wyoming, constructed by the United States Bureau of Reclamation. 328 feet high. Note the power station in the foreground.*

positions. The United States leads with over 16,000,000 h.p., Canada comes second with over 7,000,000, then, in order of amounts developed, are Italy, Japan, France, Norway, Switzerland, Sweden, Spain, Germany, Austria.

The foregoing has given a general view of the water-power resources and development of the world and we may now proceed to consider some of the outstanding examples, all that it is possible to do here.

Canada, although not possessing the largest resources or development, is selected for the more detailed examination because it is not exceeded, if equalled, by any country in the development and use of hydro-electric power in proportion to population, and because some of its water-powers possess unique advantages.

Canada stands in the front rank of the science and art of water-power devel-

opment, both in practice and in achievement, and holds or has held many of the records for size of turbines, developments, distribution systems, and other factors.

Her total resources, as definitely but by no means exhaustively ascertained, correspond to about 43,000,000 installed horse-power. The amount developed at the end of 1932 was over 7,000,000 horse-power. Construction is proceeding on several large undertakings and further development on the St. Lawrence River may now also be expected. The resources are well distributed from coast to coast, are available near all the principal centres of population and industry, and are especially abundant in the manufacturing provinces of Ontario and Quebec. The great majority of the light, power, street railways and water-works pumping in Canada is furnished by

hydro-electric power and it is clear that in the practically coal-less provinces of Ontario and Quebec the present high degree of industrialism could never have been attained without their abundant water-power.

The average annual rate of increase over the past 10 years has been over 9% and the hydro-electric construction now in hand and in view is of considerable extent. This has undoubtedly been largely brought about by the work of the Dominion Water Power and Hydro-metric Bureau of the Department of the Interior. The first essential to the consideration of any large hydraulic development, and to obtaining the necessary capital, is reliable record of the flow of the river over a long period of years. This and other related data, if not known, require years and often the expenditure of hundreds of thousands of dollars to obtain, and form a serious deterrent to the initiation of undertakings. The bureau has made just this information available in the most complete and reliable form; by its own work and by collaboration with the provincial authorities it has obtained and compiled these records for many of the principal and other potential power streams throughout the Dominion, together with all known related data, and has in many cases made exhaustive studies therefrom, and has placed all this information at the immediate disposal of capitalists and others interested. The availability of this essential data from a reliable central source has thus been of great benefit in facilitating the rapid development that has taken place.

Brief particulars of some of the leading developments are as follows:

Ontario and Quebec are fortunate in the availability of the Niagara and St. Lawrence Rivers, which constitute sources of power that appear to be unequalled on account of the combination of large capacity with exceptionally regular flow due to the immense natural storage formed by the Great Lakes, both rivers therefore offering unexcelled facilities for electro-chemical, electro-metallurgical and other industries requiring large amounts of continuous power.

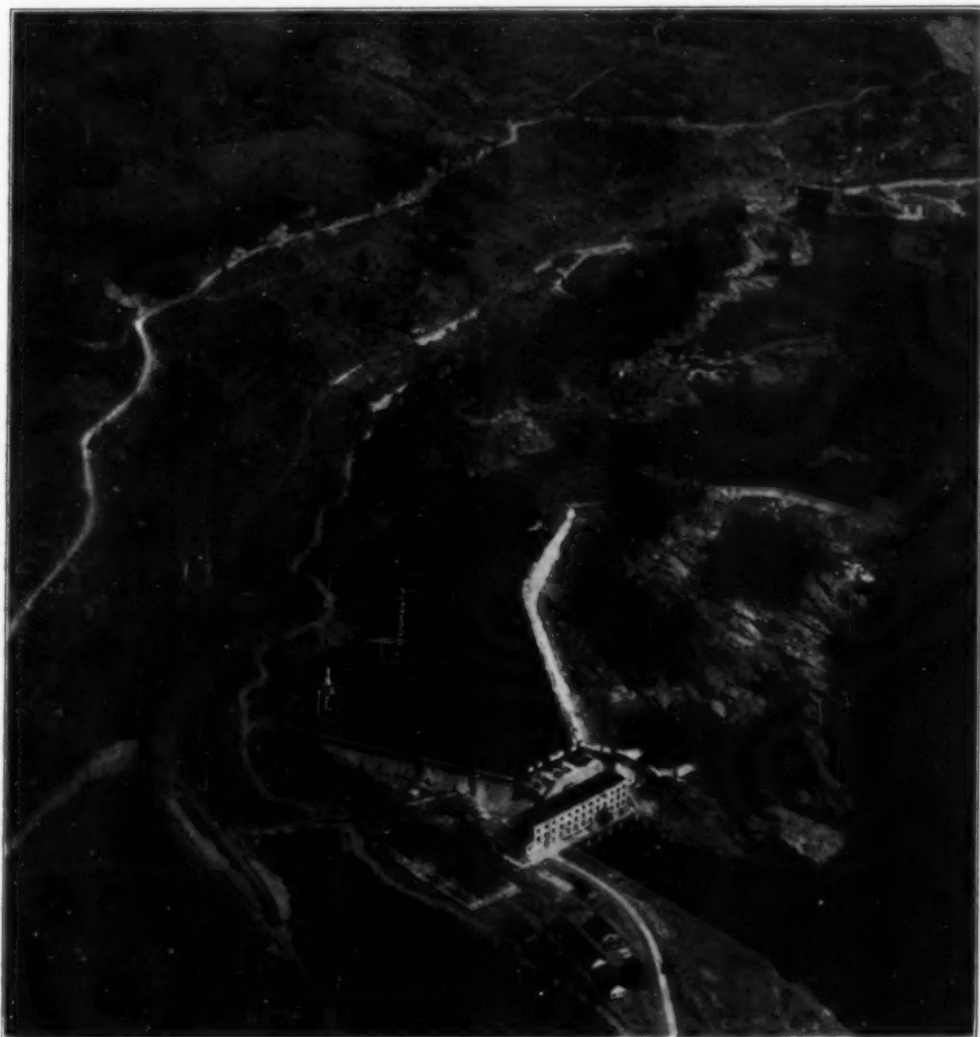
The Niagara River, as is well known has been developed on both sides of the international boundary to the limit allowed by treaty, but it is hoped that a new treaty may allow for increased diversion while providing for the full preservation of the scenic beauties by the construction of the remedial works that have been planned by the Special International Niagara Board. While the maximum capacity of the river is estimated at nearly six and a half million horse-power it is for the reason stated not probable that much more than one-half of this will ever be made available for power. Over 1,500,000 horse-power is now installed in a number of plants on both sides of the river, the largest being the Queenston plant of the Hydro-Electric Power Commission of Ontario with 560,000 horse-power installed, this being the second largest completed water power plant in the world.

The St. Lawrence River is estimated to be capable of development to the extent of 5,000,000 installed horse-power, part of which would belong to the United States. There is about 472,000 h.p. now installed in Canada, the largest plant being that at Beauharnois, near Montreal, with 200,000 horse-power in operation. These present installations are far from exhausting the maximum beneficial use of the river, as explained below, but the power possibilities have now been exhaustively investigated by Canadian, United States and International Commissions, which have indicated two major developments.

For the international section alternative sites are still under consideration, but it is estimated that a total installation of about 2,000,000 h.p. can be made, of which one-half would belong to the United States. It is interesting to note that under the carefully considered proposal, by the Power Development Commission of the State of New York, the Commission suggests that the international boundary could be changed, in favour of Canada, to run through the centre of the power house. While the Province of Ontario and the State of New York appear equally anxious to make an immediate start on the development of this section of the river the necessary international agreement has not yet been finally approved.

The other major development on the St. Lawrence is entirely in the Province of Quebec so that the whole of the power will belong to Canada, and has 200,000 h.p. now installed. This development possesses a combination of advantages that appear to be unequalled by any other. It will have the exceptional steady continuous flow already mentioned, about 2,000,000 h.p. from the completed development, it is practically in the centre of a highly industrial district, it already has first-class railway and highway communication, and, above all, it is directly

on the tide water, within 25 miles of the city of Montreal, and it will therefore give unsurpassed facilities for the largest industries. This development is being made by the Beauharnois Power Corporation for an initial installation of 500,000 h.p., but is designed and is being constructed to utilize the full capacity of the river. The works lie between Lake St. Francis and Lake St. Louis, involving a canal 15 miles long and over the major part half a mile wide, that will contain a ship channel capable of accommodating the entire traffic of the



*South Slokan development of the West Kootenay Power and Light Company on the Kootenay River, British Columbia. 75,000 horse-power installed.*



*Roosevelt dam, Salt River project, Arizona. Constructed by the U.S. Bureau of Reclamation. Note the power station at the right hand foot of the dam.*

river and forming a link in the proposed Great Lakes-to-the-Sea Waterway. The first delivery of power was made in October, 1932, and it is apparent that this development cannot fail to give an enormous impetus to the manufacturing industries of the Province of Quebec and be of direct benefit to the whole Dominion. Fuller particulars of the Beauharnois project appeared in the November, 1931, issue of the JOURNAL.

Amongst the principal tributaries of the St. Lawrence are the St. Maurice and Ottawa Rivers. The St. Maurice is the principal source of power for the Shawinigan Water and Power Company, which transmits and distributes electric power to more than 400 municipalities and adjoining territory over an area of 25,000 square miles and is the largest private power company in Canada; the company has over 700,000 h.p. installed and further undeveloped sites on the St. Maurice River totalling 1,208,000 h.p. The Ottawa River forms the boundary between the Provinces of Ontario

and Quebec, so that the power available therefrom is divided accordingly; the total capacity is about 1,000,000 horsepower; about 100,000 h.p. has been installed at Chaudière Falls, and 280,000 h.p. is under construction at Chats Falls, of which 224,000 h.p. is completed.

The Ile Maligne plant of the Duke-Price Power Company on the Saguenay River, Quebec, also flowing into the St. Lawrence, is designed for an ultimate capacity of 540,000 h.p., all but one unit of which is already in operation. At Chute-à-Caron on the same river the Alcoa Power Company, a subsidiary of the Aluminum Company of Canada, has installed 260,000 h.p. units of a plant that will have an ultimate capacity of 800,000 h.p.

The development of the Gatineau River by the Gatineau Power Company, a subsidiary of the International Power and Paper Company, is an interesting example of the complete utilization of a river for a length of 62 miles—three plants are already installed with an ulti-



mate capacity of nearly 600,000 h.p., another is to be built, and large storage reservoirs have been constructed to give complete conservation and regulation of the flow of the river, so that what was before a particularly turbulent stream causing serious floods is now controlled and placid. This company sells 250,000 h.p. for transmission 230 miles to Toronto.

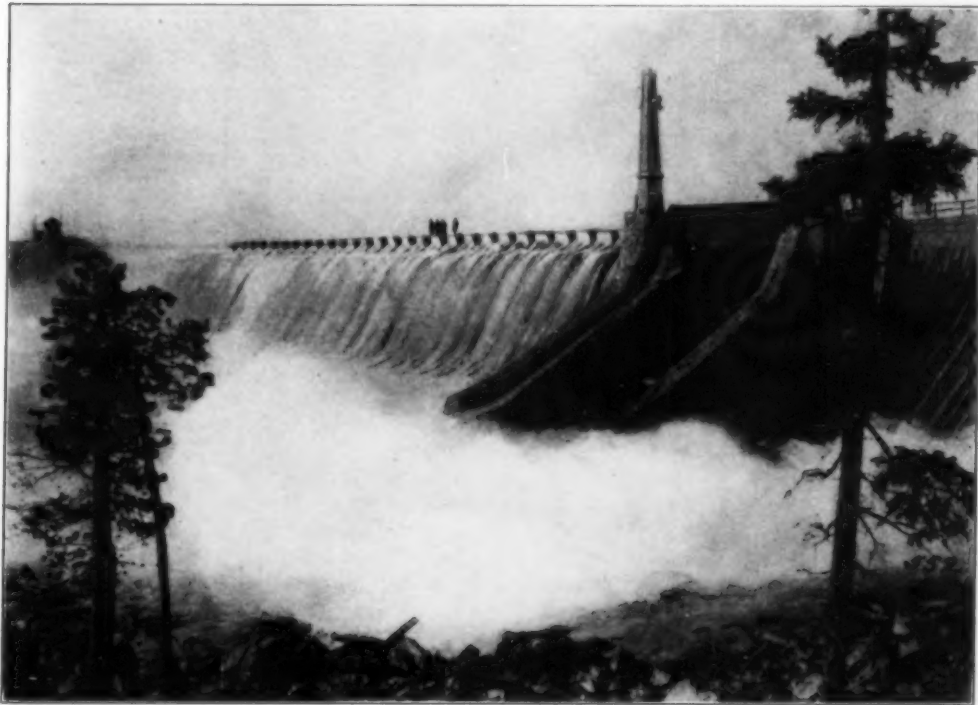
On the Abitibi River the Ontario Power Service Corporation is developing a 330,000 h.p. site.

The resources of Manitoba are estimated to be over 5,000,000 h.p. for commercial development and large use has been made of them. The Winnipeg River has a capacity of about 700,000 h.p. in seven sites of which five are developed or under construction for the supply of the city of Winnipeg and district. In this connection it is interesting to note that in this mid-western city and the surrounding area the availability of this abundant and cheap power has led to large industrial development and to the consumption of power

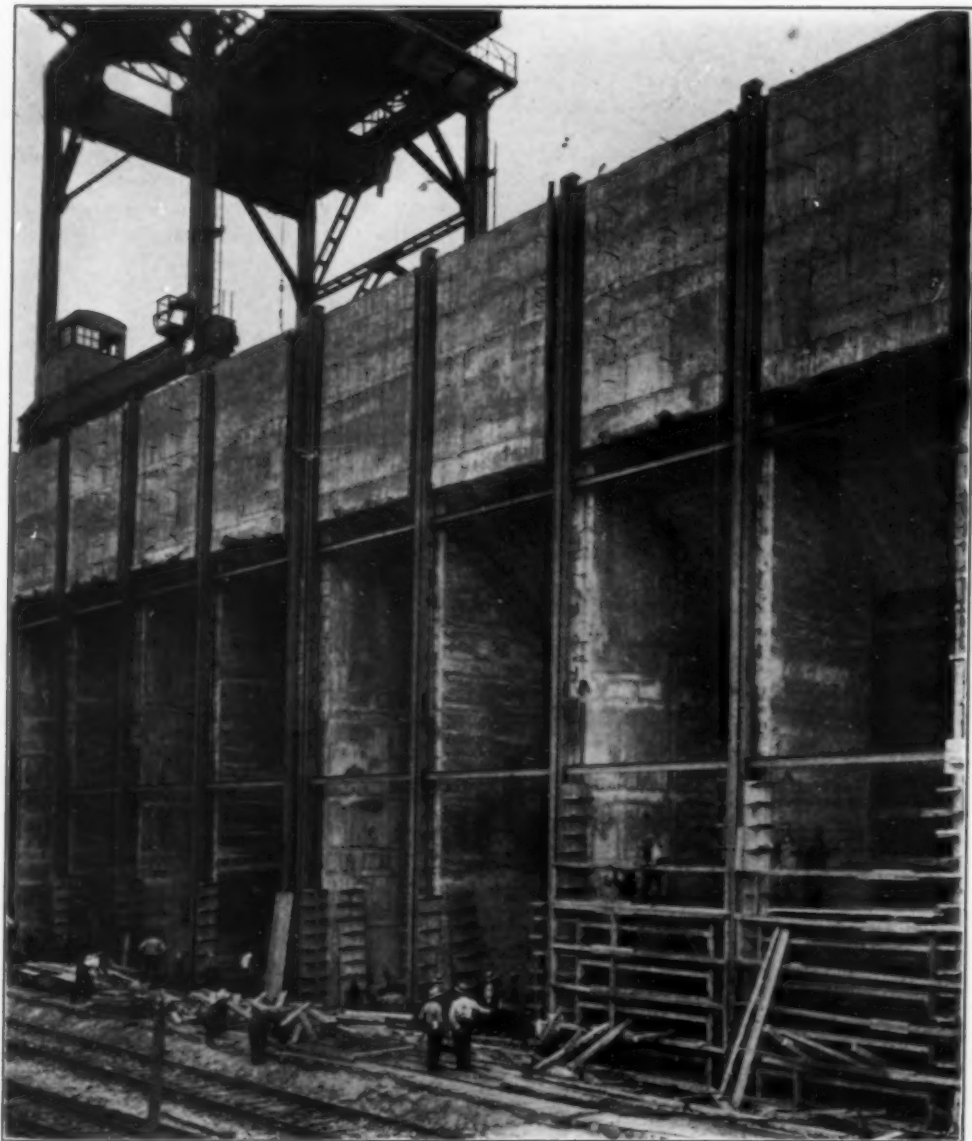
increasing over the past 10 years at the average annual rate of  $17\frac{1}{2}$  per cent. The Nelson River, further north, crossed at two points by the Hudson Bay Railway, has a number of sites with a total capacity of over 2,500,000 h.p. and the development of one of these is under active consideration.

British Columbia also possesses over 5,000,000 h.p. for commercial development and has many large plants. The British Columbia Electric Power Corporation has nearly 200,000 h.p. installed and is developing a plant with an ultimate capacity of 600,000 h.p. on the Bridge River and another of 185,000 h.p. on the Ruskin River.

The foregoing has mentioned only a few of Canada's largest hydro-electric plants, existing or under construction, but sufficient to give a view of the wide use of the power and the rapid development that is taking place. The capital invested in hydro-electric development, including transmission and distribution, now exceeds the enormous sum of \$1,514,000,000, considerably more than



*The dam at Porjus, Swedish Lapland, 30 miles within the Arctic Circle — 4,115 feet long and 42 feet high*



*Power house of the Beauharnois Power Corporation, (since completed); bulkhead and intake on upstream side of plant.*

in any other single industry except agriculture and steam railways.

The United States has now about 16,000,000 hydraulic horse-power installed and many large and striking developments, of which the most spectacular is perhaps that now under construction on the Colorado River. The Colorado River and its main tributaries affect seven States and a foreign country, Mexico. Ten years have been spent in negotia-

tions to secure agreement of the various interests and development has now been undertaken by the Department of the Interior. The total capacity of the Colorado River and its main tributaries is over 6,000,000 h.p. The first main development, known as the Hoover Dam, in Black Canyon, between Arizona and Nevada, will provide for an installation of 1,000,000 to 1,200,000 h.p. in a single plant, but the other purposes

served, flood control, irrigation of 7,000,000 acres, and water supply to the extent of 1,000 million gallons per day to southern California, are of even greater importance. The total cost of the undertaking will be \$165,000,000. The dam will rise 727 feet above bed-rock, by far the highest ever built, and it will create a lake 115 miles long by nine miles wide, with an area of 250 square miles.

Another remarkable undertaking with special features of its own is that of the Big Creek—San Joaquin River development of the Southern California Edison Company. The entire project, covering 1,407,000 h.p. at a total cost of \$375,000,000, will have 86 miles of tunnels and 18 power houses. Its most remarkable feature is the Florence Lake tunnel, 15 feet high and wide, and over 13 miles long, under the Sierra mountain range and mostly through solid granite. The total drop through a series of tunnels and power developments to the lowest power-house will be 6,000 feet.

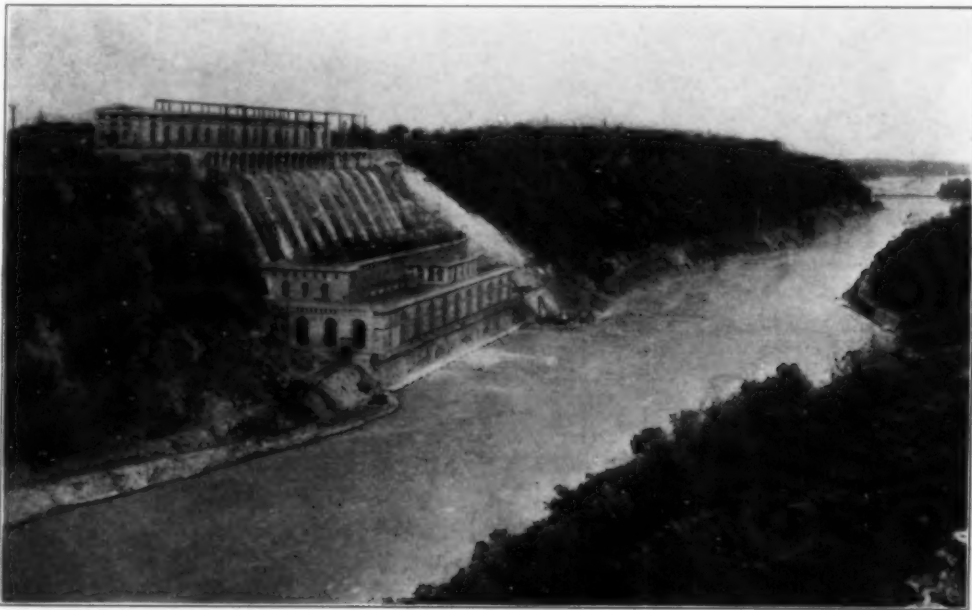
The water-power resources of the Union of Soviet Republics are large, those ascertained amounting to 8,500,000

h.p. The largest completed development in the world, that on the Dnieper River, with an ultimate capacity of 900,000 h.p., now has 756,000 h.p. installed with the largest units yet built, and a government decree has been issued for a 2,820,000 h.p. plant on the Volga, far in excess of any yet planned.

The present use of water-power within the Arctic Circle reads like a fairy tale.

About 100,000 h.p. is developed on the Great Lule River at Porjus, about 30 miles within the Arctic Circle, and is transmitted 130 miles to Kiruna in Swedish Lapland, Kiruna being about 190 miles due north of the Arctic Circle, and is there used to operate the iron ore fields. The district is also served by an electric railway which runs from Lulea on the Gulf of Bothnia to Norvic on the Arctic coast of Norway, more than half its length being within the Arctic Circle, and it crosses rivers said to be capable of producing 8,500,000 h.p.

The iron fields, stated to be the largest known, extend for about one and a half miles on the crest of two mountains. The ore averages 60 to 70 per cent pure metal and the deposits are over half a



*Power station of the Hydro-Electric Power Commission of Ontario at Queenston, Ontario, operated by canal from Niagara 12¾ miles long. Total horse-power installed, 560,000.*



Royal Canadian Air Force, photograph.

*Farmers (lower 120,000 h.p. ultimate) and Chelsea (170,000 h.p. ultimate) developments of the Gatineau Power Company on the Gatineau River, Quebec.*

mile deep. The shipments were reported some time back to be 5,000,000 tons per annum. The Government of Sweden bought a half interest in the whole undertaking in 1907.

Kiruna, now of 14,000 population, is said to be the best lighted city in the world, and not only the city but the whole of the mining area is flooded with light throughout the six months of Arctic night. The inhabitants have every modern convenience, including electric street cars free to workmen and four picture shows, and electric energy is used not only for all ordinary domestic purposes but also for the warming of beds,

the hatching of chickens and the production of flowers and vegetables in hot-houses. The regular wage for the workers in the mines is well over a dollar per hour.

The amount of power that can be developed from any stream is the product of the effective "head" or fall and the amount of water, less a loss depending on the efficiency of the plant. Thus for a given amount of power the higher the head the less the amount of water required, and vice-versa. The efficiency of a large turbine may be over 93 per cent.



In Europe there are several commercial plants operated with heads of from 24 to 42 inches. In North America there are many plants operating with heads down to five feet.

The highest head plant in the world is one at Fully, near Martigny in Switzerland, where 12,000 h.p. is developed by Pelton or impulse water wheels at a net head of 5,412 feet or over a mile, and owing to this enormous head the penstock or pipe to deliver the water is only two feet in diameter. There are no such heads developed in North America, though there are several nearly 3,000 feet.

Compared with the two-foot diameter penstock or pipe for the plant in Switzerland with over a mile head, the capacity of the tunnels or canals required for some of the moderate head plants is striking. For example, the Niagara Falls Power Company has a concrete-lined water tunnel 32 feet in diameter and over a mile long; the Southern

California Edison Company has a tunnel 15 feet high and wide and over 13 miles long, and the Beauharnois Power Corporation in Quebec has constructed a combined power and ship canal 3,300 feet wide and over 15 miles long.

On account of the great range of usable head, power can be developed on almost any river, the governing factor being the cost per horse-power and the amount justified being determined by the market and the cost of competitive fuel power.

Practically coal-less countries, such as Norway, Sweden, Switzerland and other parts of Europe and the central area of Canada (Ontario and Quebec) have by the use of their water-power been more than able to compete in manufacturing with the established industrial countries amply supplied with coal.

Nothing has been said here on the wonders of the transmission of hydro-electric energy.



*Pointe de Bois development of the City of Winnipeg on the Winnipeg River, Manitoba. 105,000 horse-power installed.*



Interprovincial Airways Limited, photograph.

*Aeroplane view of the Laurentide plant of the Shawinigan Water & Power Company at Grand-Mère Falls on the St. Maurice River, Quebec. 198,000 horse-power.*

Modern high-tension transmission lines are frequently in duplicate, consisting of two single circuit lines carrying 250,000 h.p. each for hundreds of miles on steel towers occupying a right of way up to 350 feet wide, and costing \$40,000 to \$70,000 per mile, or more than many a first-class main line steam railway.

Countries possessing ample water-power often benefit their neighbours as well as themselves. Switzerland in 1929 transmitted 25% of the total output to Italy, France and Germany. Norway is proposing to transmit 1,000,000 h.p. to Germany via Sweden and Denmark, over a line 625 miles long carried across the sea on towers 600 feet high, at an estimated cost of \$200,000,000. Canada

transmits a large amount to the United States.

Experimentally, by the inter-connection of the transmission lines of intervening companies, a district in Boston has been lighted by power from Chicago, a distance of 1,000 miles. On the Pacific Coast it is possible to give supply over interconnected lines for a distance of 1,500 miles.

Long-distance transmission had led to great spans for the crossing of rivers, bays and mountains chasms or valleys. There are several such single spans of about a mile in length, but the longest of all is believed to be that across Puget Sound, Washington, a single unsupported span of over 6,240 feet or nearly one and one-quarter miles.



# Canadians in Brittany

By ELIZABETH CHURCH

"YOU and I," said Jane, "are going back to Brittany for our summer holiday."

"Back," I echoed, "But we've never been there!"

"Our Canadian ancestors came from there. In every corner of Canada there are people who can trace their family histories back to Brittany or Normandy. And think of the modern commercial connections that we have! In St. Malo to-day they are building docks large enough to hold the largest Canadian merchant vessel."

A month later we were in Paris. A week after our arrival there, we travelled all day by train across France into its most north-westerly province, Brittany.

We passed the gardens and chateaux of Versailles and Mantes, the Cathedral of Chartres, the city of Rennes, the town of Fougères. At sunset we reached our journey's end and felt the salt breeze blowing from the ocean.

"Je suis Abel."

A tall, blue-eyed Breton claimed us as his fares.

As we took our seats in his motor bus, Jane pointed to his name upon the side, "A. Belle." But "Abel" was the name by which he was known on the many happy outings

we had in his comfortable old car.

A drive of four miles led downward to the tiny peninsula of St. Jacut de la Mer. The black rocks jutting into the sea lay like a relief map before us. The one narrow street—its massive stone houses had been built in medieval times, compactly together as a means of defence—led to the outermost point of the promontory, to the very gates of our pension, the Abbaye of St. Jacut.

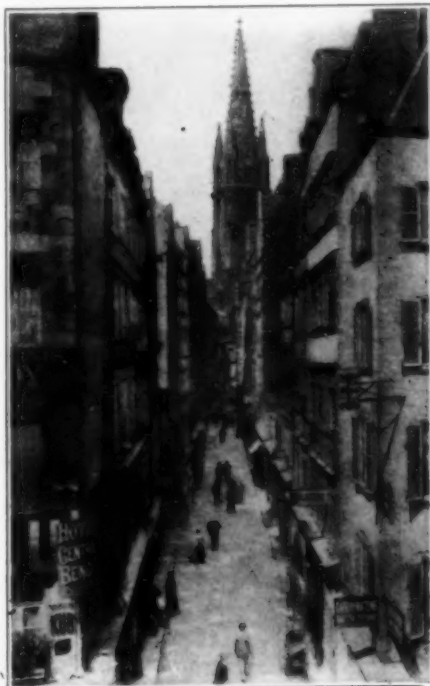
A part of this ancient convent dates further back than the sailing of Jacques Cartier, and the walls surrounding it are so much a part of the cliffs that they seem forever closed to the world. But at the magic words of "Abel," a bell rang. The gates swung backward. We passed through the ivy-covered walls into the great colourful garden and drew up at the arched entrance.

After a cordial greeting from a "nearly 400 years ago, our Bretons sailed across the ocean to your distant land. Now many hundreds of our fishermen go every summer to the coast of New foundland and return every autumn to their homes here. They earn good wages.



ELIZABETH CHURCH

was educated at King's Hall and McGill University, Montreal. She was a volunteer worker of the Association des Dames Françaises in war-time hospitals in France. She is a member of the Canadian Author's Association and of the Canadian Women's Press Club.



*The Cathedral of St. Sauveur at the end of the Grande Rue St. Malo.*

Their children are in our schools."

Presently she touched a hand-bell. A fair young girl Sister Marie-Therese, answered. She handed a lighted candle to each of us.

We followed her along the worn stone floor and up the narrow, red-paved stairway.

Our white-washed cells were close under the eaves. The beds were so immense that they could not have been brought up the stairway or through the door. They had been built in the rooms, as we learned when we tried to move them about later. A wash-stand and a chair completed the furniture. Jugs of hot water were upon our stands.

A bell sounded.

"Le souper est servi dans le réfectoire, mesdames." Sister Marie-Therese bowed and vanished.

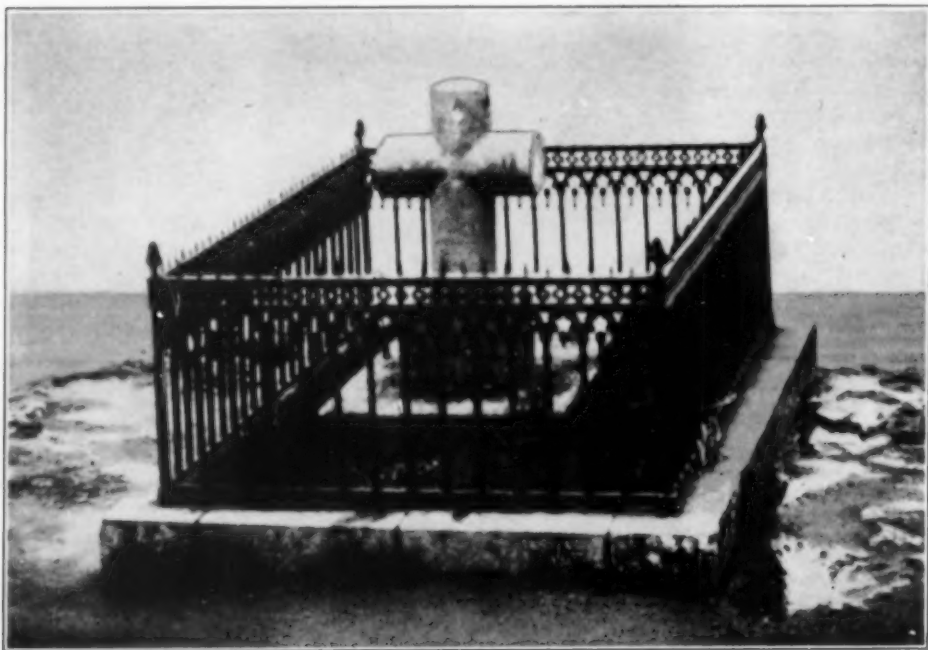
A second bell rang as we entered the great refectory. At the long tables, gay with many flowers and lighted candles, the summer guests were already seated. The simple, delicious food was served by pleasant-faced women garbed in heavy black.

"These ladies waiting upon the tables," said the Englishwoman seated beside me, "are the nuns who were in residence here when the State forbade certain privileges. They were allowed to stay on in their beloved Abbaye on condition that they would not wear religious garb and that their doors would be open to paying guests. We are lucky to be here!"

Early next morning we walked to the point of the promontory and stood entranced by the glory of sky and sea. In the distance we could see little villages nestling in the coves and the allure of their nearness brought exclamations from Jane.

Studying her map, she said, "I'm sure we can walk as far as that one. That's St. Cast on the left and away over on our right is that very smart place, Dinard. Let's go through the village first. Then we'll go back to the Abbaye for our bathing togs and down to the beach for a dip."

As we wandered along the one narrow, winding street of solid stone houses, we met aged women driving



*Tomb of Chateaubriand on Ile Grande Bey, off coast near St. Malo.*





*Panoramic view of the ancient city of Dinan.*

the family cow for its day's pasturage to the common beyond the village limits. Groups of sturdy fishermen were going down to the wharf to set sail for the day's catch. Parties of young women, with great bundles under their arms, were on their way to the huge, stone wash-basin, which, built across a brook, is used in common by all the villagers.

They smiled and nodded at one another and at us, as if happy to be alive in the warm, vibrant sunshine; and we glad to be amongst these friendly peasant folk, smiled and nodded back.

"Paradis des enfants," said Jane, pointing. "Isn't that an adorable sign for a toy shop! Let's go in!"

The wooden toys covered two long tables, set just within the doorway of the one living-room. The floor was of packed earth, and two immense four-poster beds with the snowiest of canopies and spreads took up the greater part of the space. We bought some carved wooden dolls from a smiling, toothless, ancient dame and withdrew

from the dark interior of her home to the sunny, sea-breezy street.

Another sign, "Aux Doigts des Fées," attracted our attention where the work in the window was of a delicacy that one could well believe that fairy fingers had made the stitches.

A large wooden hand, with the words, "A La Plage," pointed the path to the much-frequented beach where venerable dames do a thriving business renting the tiny bath-houses and selling tartines to a swarm of gesticulating youngsters.

But after our first morning there we did not go back to the crowded plage. We found our own secluded cave in one of the retired nooks formed by the great frowning cliffs, which separate at intervals the smooth stretches of sandy beach. There we carried our bathing kits, and after putting on our suits we could while away a never-to-be-forgotten morning, swimming, sunning on the sands, splashing in the green waves again, dressing in our

very own cave, hurrying back to the Abbaye in time for the savoury lunch.

St. Malo was only nine miles away and one morning "Abel" drove us over the fine road, past old farmhouses, past tiny villages walled and fortified as in the olden days of constant warfare, through the towns of Tregon, Beausavais, Ploulalay, to the smart seaside town of Dinard. This resort is a favourite with American and English visitors. Its modern, fashionable hotels were crowded with tourists from every country in two continents. The beaches were a panorama of colour, gay with hundreds of bathers and many rows of brightly-striped sun umbrellas.

After a perfect French lunch at an open air cafe bearing the ironical name of "La Nourriture Anglaise," we walked down to the wharf.

Dinard with its gayety, its casinos, bathing cabins, new villas, is modern to such a degree that to look across the Rance at the grey old town of St.

Malo, is to contrast two very separate periods of history.

The Rance, an arm of the sea up which the tide flows 15 miles inland as far as the city of Dinan, renowned for the historic chateau constructed by the Dukes of Brittany in 1382, for their beloved Duchess Anne, is the dividing line between the two towns.

Across this arm we could see "Le Vieux Rocher" as the Malouins call their old city fastened to its rocky islet by its ancient grey ramparts. The "Town of the Pirates" the English nicknamed it many years ago, because of the doings of certain privateers fitted out at this port.

We could not resist the charm of its severity.

Twenty minutes in a vedette — a taxi motor boat — in and out amongst the crowding traffic, brought us across the Rance to the stone quay where the waves beat the walls of the city. Tradition tells us that in the sixth Century, a monk known as the Hermit



Auclair-Melot. Courtesy Railways of France.

*An old café at Lannion.*



*Old Breton sailors, on the quay of Ile Tudy.*

Aaron retired to this rock and a Welshman, Malo, became his disciple there; and that later the name St. Malo was given to the retreat.

We entered by the Porte de Dinan. The streets are closely packed together on the islet in the narrow space between the massive walls. In fact the whole is not more than three miles in circumference, so the monuments of history are easily found. The natural centre of the town is the Cathedral of St. Sauveur. The nave of Gothic design dates back to the 12th Century, and there, at the entrance to the choir, we found what we were looking for. A slab set in the pavement bears the inscription:—

"Here knelt Jacques Cartier to receive the blessing of the Bishop of Saint Malo at his departure for the discovery of Canada, the 16th of May, 1534. Honore Mercier . . . of Quebec; Souvenir of his visit, 1891."

At every turn we found memorials of those gallant gentlemen, Maupertis, Porree, Duguay, who spent their lives upon perilous seas to bring honour to their beloved France. Louis XIV realized the courage of the Malouins, for in his "Studies of the French Shores on the Ocean," Baude says that in 1665, the king commanded that "The flagship of his fleet should be always and exclusively manned by the Malouins."

The ramparts of St. Malo date back to the 14th Century and the road along their summit has become the classical promenade of the town. No wonder, indeed, for the view of the sea is unsurpassable. From that point of vantage we saw a most interesting sight. A gaily-decorated fleet was almost ready to sail. These were the 200 fishing schooners which leave every spring for their six-months' fishing off the Grand Banks of Newfoundland. Crowds of

people swarmed around the fleet and on the wharves, for more than 20,000 spectators had gathered from points in northern France to give the boats a rousing send-off. The ceremony of their blessing and departure has formed for centuries a typical Breton festival. Hovering in the offing, as a symbol of protection, was the old gunboat, "Ville d'Ys." It sails with the fishing fleet as a sort of honorary guard. After escorting the schooners as far as the Grand Banks, it comes up the St. Lawrence to Montreal to have a friendly visit with the Canada of today.

Much movement was taking place on the quay below us. Ships laden with coal, salt, wood, phosphates were mooring. Others, with the produce of the rich agricultural district around St. Malo, were leaving for England. Excursion steamers, crowded with tourists, were starting on the two-hours voyage which would bring them to the island of Jersey.

We went on around the ramparts, passing the Chateau, built by Duchesse Anne in 1498. The left tower, Quinquengrogne, still bears an inscription which means, "Let those grumble who would," for the citizens were displeased with their duchess for her high-handed building of the castle. Past the Gateways of St. Vincent, St. Pierre, St. Louis and Des Champs Vauverts, each a historic monument in itself, we came to a turn from which we could see distinctly the solitary tomb of Chateaubriand on the islet of Grand Be. This great writer, a Breton to the backbone, was born in the old house, 15 Rue des Juifs, and he chose as his last resting place this rock where the waves of the Atlantic sing his requiem forevermore.

Going into the Museum, we searched for and found the historic fragments of the Petite Hermine, one of Jacques Cartier's boats, which, wrecked near

Montreal in 1537, was later discovered and sent back by the city of Montreal to St. Malo.

Farther along the ramparts we came upon the bronze statue of Jacques Cartier by Bareau. There Cartier stands, head thrown back, eyes searching the sunset path to the west!

Below the monument an old gardener in a blue blouse—even the workmen reveal an artistic sense for they always fit into the picture by wearing that gorgeous blue—was tracing with his fingers the initials, J. C., and filling in the lines with bright blooming plants.

From the height of that memorial square, we could see, away off in the distance, the docks now ready to hold the largest merchant vessels Canada can send over.

From the other side of our place of vantage we could see the modern suburbs which have grown up outside the walls—St. Servan, the business section, and Parame, the summer resort, are connected with St. Malo by tramways and bridges.

As we looked down the tide was fast going out and the appearance of the harbour was much different from what it had been at full tide. The stretches of glittering sand, which had been covered by the waves rushing up the Rance a few hours before, when we had crossed from Dinard, were now quite dry in their half-mile of solid beach. As for the shipping, it was all propped up against the quays with hurls perfectly bare. Between low and high tide level there is usually a difference of about 25 feet, and the spring tides show a variation of almost 50 feet.

A call to prayer sounded from the bell of St. Sauveur. "The cathedral bell "said Jane" which struck a welcome for Jacques Cartier when he returned from Canada."





## THE SMOKE OF THE BRITISH EMPIRE



*This famous old Kentish tavern, the Leather Bottle Inn, will be remembered as the retreat whither fled the lovers of Tracy Tupman of Dickens' "Pickwick Papers"*

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## Editor's Note Book

As the result of confusion in moving editorial material from the Woodward Press to the new publishing offices of the Society, several mistakes crept into the December number, for which the Editor expresses his very sincere regrets. In the biographical sketch on p. 227 "Scarlet and Gold" should have been described as the organ of the Royal North-West Mounted Police Veterans Association, and Mr. Munday as Secretary of the Vancouver Section of the Alpine Club of Canada. Also the illustration on p. 214 should have been credited to Thomas Nelson and Sons, to whom we were indebted for permission to reproduce it; and the painting reproduced on p. 212 is not in Hart House but in the Art Association of Sarnia.

\* \* \*

For the convenience of members who are having their volumes of the JOURNAL put into permanent binding, a cumulative index covering the complete contents of Volumes I to V, inclusive, has been prepared. A copy of this will be mailed to any member desiring it, on application to the publication office. For the future, a similar index, amended to date, will be included in the last number of each volume.

\* \* \*

In its 1932-33 series of Free Public Lectures the National Museum of Canada includes several that are of particular interest to members of the Canadian Geographical Society. In February F. E. Holloway of Montreal will deal with the "British West Indies and its Products," J. M. Humphrey of Malakwa, B.C., with the "Mountains and Lakelands of British Columbia" and William G. Ernst, M.P. of Lunenburg, N.S., with the history and resources of his province under the title "From Cape North to Cape Sable." In March L. R. McGregor, Australian Trade Commissioner to Canada, will lecture on some aspects of life in the great sister Commonwealth, and Loris S.

Russell of the Geological Survey, will conduct an imaginary excursion across the Prairie Provinces from Winnipeg to the Rockies. An interesting feature of these lectures, which are given in the lecture hall of the National Museum, accompanied by lantern slides and motion pictures, is that each is given on a Saturday morning to children, and on the following Wednesday evening to adults. They have become extraordinarily popular.

\* \* \*

This description of a banyan tree in the New Hebrides, by Miss Evelyn Cheesman, is an admirable example of natural history at its best: "There is an endless attraction about a banyan; the intriguing lines of its roots and branches lure the eye through a meshwork which though apparently lawless and meaningless has a symmetry of its own when studied closely. The sad Casuarina with its drooping green tresses is a poem, but the banyan is blank verse, and very rugged verse at that. Sit down and make a study of any part of it and you will find that there is not a curve or angle which could be altered without spoiling the harmony of the whole. Chiefly the charm lies in its being so full of contrasts and surprises. Plump, rounded limbs with dimples are set against gnarled, sharply angled elbows. Trunks and boughs of colossal sculpture above, and below a very delicate fringe of aerial rootlets hanging like a curtain over mysterious recesses where pitch darkness exists in broad daylight. Boughs merge into roots so that it is impossible to say where one ends and the other begins—or whether they rightly belong to the banyan at all. For each tree is really a community—a cosmopolitan crowd, the foliage of which is mixed with that of the host. All manner of parasitic and epiphytic plants, from large figs to delicate creepers, making use of the banyan in different ways, neighbours, mendicants, and hangers-on."

## Resorts - Travel - Recreation

Among the minor but not altogether negligible advantages of travel are the opportunities it affords of correcting old misapprehensions. For instance, a Canadian who had not been England until he had reached middle age, discovered quite unexpectedly the solution of a puzzle that had mildly intrigued him since boyhood. He had accepted without question, probably like thousands of other Canadians, the version of an ancient children's play song that runs "Here we come gathering nuts in May," but had wondered vaguely why or where one could gather nuts in May.

Walking about the colleges at Oxford, his eyes were attracted by a mass of exquisite bloom.

"What is that?" he asked.

"May," replied his friend.

"May," he echoed, with an air of puzzlement, while through his mind ran

trippingly "Here we come gathering nuts in May."

"Why, of course!" he cried, "It's not 'in' but 'and.'"

"What on earth are you taking about?" asked his companion.

"Here we come gathering nuts and may," said he and thereupon explained a lifetime problem.

\* \* \*

The people of Cornwall have long borne the more or less unjust reproach of deliberately causing wrecks. It was, however, in the Scilly Isles that Parson Troutbeck is said to have added to the litany this remarkable petition: "We pray Thee, O Lord, not that wrecks should happen, but that if wrecks do happen, Thou wilt guide them into the Scilly Isles, for the benefit of the poor inhabitants," which petition was doubtless followed by a heartfelt "Amen."

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A curious phenomenon of the sea is described in Ivan Champion's "Across New Guinea." It is known as a bore and originates near the mouths of certain rivers. Those who live in the neighbourhood of Chignecto Basin are familiar with this phenomenon on the Petitcodiac. The bore described by Mr. Champion "starts on the northern bank of the Fly and sweeps up river in a wall of water several feet high as far as 120 miles from the mouth. Woe betide the small boat that is caught in it."

Somerset Maugham gives a vivid account of the same conflict between tide and river current in one of his stories the far east.

\* \* \*

And while we are on the subject of curious phenomena, here is one that is essentially human. The white race is inclined to take such a superior attitude toward those that are classed as yellow, black or brown, and one hears so much about the characteristic and more or less offensive racial smells of Negroes, Chinese and Eskimo, that it is somewhat disconcerting to discover that to them the smell of a white man is equally offensive.

Some where in Mrs. Soothill's delightful narrative "A Passport to China" she tells of her chagrin in being told, in as polite terms as it could be expressed, that to a Chinaman the characteristic smell of a European was at first quite overpowering. A traveller in Africa had the same experience with members of some of the tribes of the interior. And Lowell Thomas, in "Kabluk of the Eskimo" quotes the French traveller Romanet to this effect:

"At close quarters I noticed a peculiar odor emanating from Anotinoak, the Eskimo scent, but I was becoming used to it. When I got to the windward of him, I noticed that he wrinkled his nose and moved away. At first I did not sense anything wrong, but when it happened again and again, I was dumfounded to realize that my aroma, the white man smell, was as disagreeable to him as his had originally been to me."

\* \* \*



One is constantly finding new evidence of the old saying that there is no new thing under the sun. In an account of Chinese travels, fifteen hundred years or so ago, there is a description of how a monk, one Ming-yuan, who had made a pilgrimage to Ceylon, attempted to steal the famous and most holy tooth of Buddha, which was preserved in a high tower and protected with many doors and complicated bolts. If any of the doors was opened a resounding noise warned the guards. Ming-yuan actually managed to steal the relic, but was caught before he could escape. The plot inevitably suggests the late lamented Edgar Wallace.

\* \* \*

As the Canadian Geographical Society intend to have only a few representatives soliciting memberships present members and others interested in taking out memberships are asked to request to see the credential card with which each representative is supplied. The expiry date of these credentials are indicated thereon.

\* \* \*

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## Amongst the New Books

*Canadian Landscape Painters.* By Albert H. Robson. Toronto: The Ryerson Press. 1932. \$7.50.

Someone asked "what has landscape painting to do with geography?" Such a book as this furnishes a sufficient answer. Broadly speaking it was the main purpose of the fifty one Canadian painters here represented to interpret the infinite variety of their country. Consider some of the titles of the seventy five pictures that are reproduced in colour: "Maple Sugar Harvest," "The Habitant Farm," "In the Laurentians," "A Pioneer Cabin," "A Prospector's Camp," "Birches in Temagami," "On the St. Lawrence," "The Mountaineer's Home," "A Canadian Trail," "Above Lake Superior," "Georgian Bay," "A Western Homestead," "Winter in Muskoka," "A Quebec Village," "The Totem Pole." From Paul Kane and Cornelius Krieghoff to Tom Thomson and A. Y. Jackson, the book gives on the whole a fair idea of the quality and variety of Canadian landscape art in the last seventy or eighty years. The treatment is descriptive rather than critical, and the paintings are allowed to speak for themselves. As a piece of Canadian book-making it reflects great credit upon the publishers.

\* \* \*

*With Pen and Pencil on the Frontier in 1851.* Edited by Bertha L. Heilbron. Saint Paul: Minnesota Historical Society. 1932.

Something over eighty years ago a young American artist, Frank B. Mayer, travelled from Baltimore to Minnesota, making sketches of Indian life and frontier conditions, and keeping a diary of what he saw and heard by the way. This diary Miss Heilbron has edited, and the book is illustrated with a large number of Mayer's sketches, including one of the Treaty of Traverse des Sioux. The narrative covers the artist's journey down the Ohio to Cincinnati,

by stage and boat to St. Louis, up the Mississippi to Saint-Paul, and a very interesting account of Indian life and pioneer conditions in Minnesota.

\* \* \*

*Observational Geography.* By E. M. Sanders. London: George Philip and Son. 1932. 216.

An attempt—and one would say a successful attempt—to interest young pupils in geography by means of simple, homely illustrations and experiments.

\* \* \*

*Forest Wild.* By M. Constantin-Weyer. Toronto: The Musson Book Company. 1932. \$2.

A young Frenchman, tired of city ways, wandered to an out-of-the-way part of the Canadian west, and made a home for himself in the forest. Here he hunted and fished, studied the home life of Indians, and the ways of moose and bear and deer, muskrat and beaver, gopher and prairie hen. He recounts stories told him by old-timers of the last days of the buffalo and how they were hunted, and tales of conflict between Sioux and Assiniboine. He even has something to say of that indomitable French-Canadian explorer La Verendrye, who stood on the banks of the Red River two hundred years ago, and was one of the first of the pioneers of Western Canada.

\* \* \*

*Twenty-five years of Ontario's Mining History.* Toronto: Department of Mines. 1932.

When one remembers that within the period covered by this survey the production of gold in Ontario has put Canada in second place among the gold-producing countries of the world, and that the nickel deposits of Sudbury are by far the greatest known, the importance of this record of discovery and development is appreciated.

\* \* \*

## *Confidence in its Services*

● *Shown by the several branches of Canada's mining industry has long been a source of pride to the Department of Mines.*

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MAPS AND REPORTS ON REQUESTS

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CHARLES CAMSELL  
*Deputy Minister*

## A Message of Appreciation

The Executive of the Canadian Geographical Society is very gratified and encouraged to know that in its efforts to reestablish the JOURNAL and keep the Society alive in these very difficult times, it has the whole-hearted support of its members throughout the country. This is shown not only by the large number of letters received by officers of the Society, but also through the prompt response to my appeal to you to renew your membership subscriptions and persuade your friends and acquaintance to join the Society. I earnestly hope that those of you who have not yet found time to do a little missionary work for the Society among your neighbours will take the earliest opportunity of adding their names to our membership roll. Every new member, and every old member who renews his membership, makes the position of the Society and the JOURNAL more secure, and hastens the time when we will be in a position both to enlarge the magazine and embark upon other activities of interest to our members and benefit to the Dominion. As I mentioned in my previous letter, the Society has as yet no endowments, and receives no grant from the Dominion or any other source. It is dependent entirely upon the fees of its members. Outside support could not fairly be asked at a period when the resources of all governments are being taxed to their uttermost. That may come later, but in the meantime there is something heartening in the thought that we are able to carry on through hard times with our own membership fees.

With best wishes for 1933,

*Charles Camsell*

PRESIDENT,  
CANADIAN GEOGRAPHICAL SOCIETY

(DETACH HERE)

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